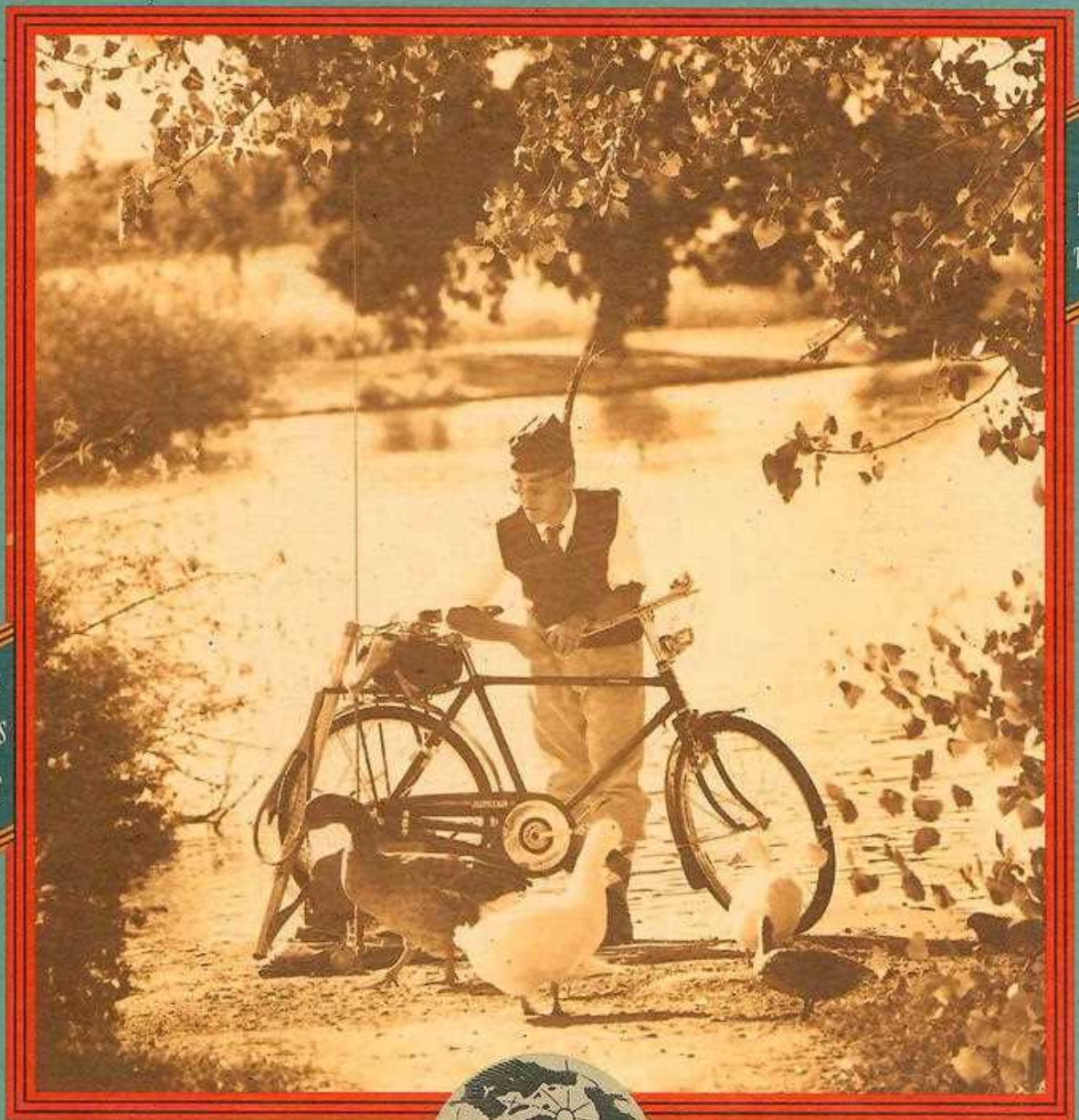
BRIDGESTONE

THE 1992 BRIDGESTONE BICYCLE CATALOGUE



A LONG TIME!

OUR BIKES LAST

MAKERS OF FINE BICYCLES RIDDEN THE WORLD ROUND

DARK RED

MB-3

ROUGH-N-READY

XO-3

TREASURE FOUND

BLUE

PURPLE METALLIC

SMART RB-2 MONEY

CHAMP'S CHOICE

MB-1

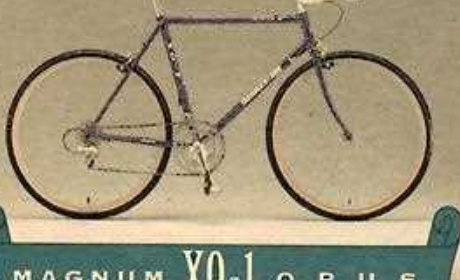
PEARL TUSK

PEDALER'S PRIZE

MB-4

PEARL WHITE

PURPLE METALLIC



MAGNUM XO-1 OPUS

MB-5

TRIED-N-TRUE

DARK GREEN METALLIC

DARK BLUE TUSK

RB-2

ALL ABOARD!

GREEN METALLIC
ONE OF RB-T A KIND

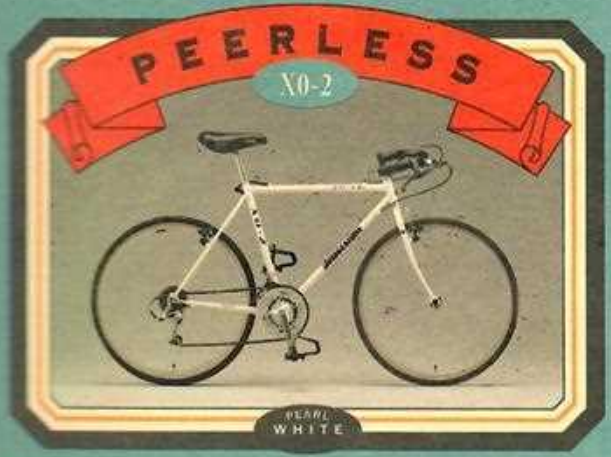
NON PAREIL
XO-1
PEARL TUSK

PURPLE METALLIC
MB-2
TOP NOTCH!

CB-1
LAST CHANCE
RED

MB-6
SPOKED-N-STOKED
DARK RED

YELLOW WHITE
RB-1
UNRIVALLED


PEERLESS
XO-2
PEARL WHITE

RED
SOONER BB-1 OR LATER

XO-3

TREASURE FOUND

The XO-3 solves many problems of the conventional "hybrid": Its "ARC" bars position your wrists more inward, for better climbing and sprinting, and an extra hand position. The top-mount shifters are easier to use than underbar shifters; and the round chainrings promote smooth pedaling. Shimano 300CX derailleurs and crank; Ritchey tires; and stainless-steel spokes.

PRODUCTION QUANTITY: 3,000
SIZES: 43, 46L, 48, 52, 57CM

MB-3

Last year in a review of 12 "mid-priced" mountain bikes, *Bicycle Guide* rated the MB-3 the best. All modesty aside, this didn't surprise us in the least. The new MB-3 will continue to win the $750-$800 price category.

FIRST YEAR MADE: 1987
FRAME BUILT IN: TAIWAN
PRODUCTION QUANTITY: 4,500
SIZES: 38, 42, 46, 49, 52, 55 CM

FRAME: Ritchey Logic
WHEELS: 26" Ritchey V-Expert rims, Megabite tires, Wheelsmith spokes
COMPONENTS: Shimano Deore DX with Dia-Compe brakes

ROUGH-N-READY

CHAMP'S CHOICE

MB-1

FIRST YEAR MADE: 1984
FRAME BUILT IN: JAPAN
PRODUCTION QUANTITY: 1,200
SIZES: 38, 42, 46, 49, 52, 55CM

In 1986 the MB-1 was the first production mountain bike to come stock with many features that are now "industry standards," including toe clips and straps, narrow handlebars, two-finger brakes, and sub 17" chainstays. The '92 model is our best and lightest yet. SunTour XC Pro derailleurs, Ritchey Logic™ crank, and Logic™ frame tubes.

The RB-2 has the same frame geometry and road handling as the RB-1, with less-expensive parts. No other bike in its price range–$575 to $600–can match the RB-2's ride or the quality, and if you can't afford an RB-1, but insist on the same great ride, this is your bike. Shimano drivetrain, Dia-Compe brakes, Ritchey tires.

FIRST YEAR MADE: 1988
FRAME BUILT IN: JAPAN
PRODUCTION QUANTITY: 1,500
SIZES: 50, 53, 56, 59, 62 CM

SMART RB-2 MONEY

The XO-1 seems to have no weaknesses. It's a fast, not merely passable road bike; it's a super commute bike or touring bike; and its off-road capabilities will have you rethinking all that you "know" about mountain bikes. Shimano shifters, Sugino crank, Dia-Compe brakes, The World's Most Expensive Fork Crown, and Moustache Handlebars.

FIRST YEAR MADE: 1992
FRAME BUILT IN: JAPAN
PRODUCTION QUANTITY: 1,000
SIZES: 42, 48, 52, 55, 59CM

MAGNUM XO-1 OPUS

PEDALER'S PRIZE

MB-4

FIRST YEAR MADE: 1987
FRAME BUILT IN: TAIWAN
PRODUCTION QUANTITY: 4,500
SIZES: 38, 42, 46, 49, 52, 55CM

At 27.6 lbs. (49CM) the MB-4 is just the bike for a rider who wants foolproof shifting and raceworthiness–but cannot afford an MB-3. Our product manager's favorite bike.

FRAME: Tange butted CrMo
WHEELS: 26" Ritchey V-Expert rims, Megabite tires, Wheelsmith spokes
COMPONENTS: Shimano Deore LX with Dia-Compe brakes

RB-2

The RB-2 has the same frame geometry and road handling as the RB-1, with less-expensive parts. No other bike in its price range–$575 to $600–can match the RB-2's ride or the quality, and if you can't afford an RB-1, but insist on the same great ride, this is your bike. Shimano drivetrain, Dia-Compe brakes, Ritchey tires.

PRODUCTION QUANTITY: 1,500
SIZES: 50, 53, 56, 59, 62CM

ALL ABOARD!

MB-5

TRIED-N-TRUE

FIRST YEAR MADE: 1987
FRAME BUILT IN: TAIWAN
PRODUCTION QUANTITY: 5,000
SIZES: 38, 42, 46, 49, 52, 55, 58CM

FRAME: Tange butted CrMo
WHEELS: 26" Ritchey V-Sport rims, Megabite tires
COMPONENTS: Shimano 500LX & 400LX, with Dia-Compe brakes

The MB-5 is the only bike in its price range–$480 to $520– with top-mount shifters, round aluminum chainrings, and smart parts. With the same geometry and handling as our most expensive models, you cannot beat this bike at this price.

NON PAREIL

XO-1

Frame: Ishiwata seamless CrMo
Wheels: 26" Araya rims, Tioga slick tires, Wheelsmith spokes
Components: Shimano 105 derailleurs, Dia-Compe brakes, Ultegra bar-end shifters, and Nitto-built/Bridgestone designed "Moustache Handlebars." Great bars.

The XO-1 has no weaknesses. It is our pride and joy, a truly wonderful, versatile bike that will thrill even the unthrillable.

Production Quantity: 1,000
Sizes: 42, 48, 52, 55, 59cm

First Year Made: 1990
Frame Built In: Japan
Production Quantity: 1,000
Sizes: 50, 53, 56, 59, 62cm

Unlike most *pure* touring bikes, the RB-T handles quite well unladen; unlike many of today's triple-chainwheel road bikes, it accepts tires up to 700 x 38c; and unlike virtually all of its competition, it is made in Japan by the company whose name is written on the downtube! Shimano drivetrain with bar-end shifters; Dia-Compe cantilever brakes.

ONE OF RB-T A KIND

CB-1

LAST CHANCE

Frame:
Three tubes CrMo
Wheels:
26" Araya rims,
Cheng Shin 1.9 knobbies
Components:
Shimano 300LX.
Top-mount shifters

This year's CB-1 is pretty much the same bike as the BB-1, but costs less due to a bolt-on rear wheel and stain-resistant (not stainless) spokes. The upright handlebars accommodate a relaxing, upright body position perfect for casual outings, and the handling qualities of this bike belie its low price.

Production Leftover: ~4,500
Sizes: 42, 43L, 46, 49L, 50, 56cm

MB-2

The MB-2 is always a favorite with Bridgestone employees, shop employees, and smart racers. Its lugged frame is made in Japan in our own factory.

Production Quantity: 2,500
Sizes: 38, 42, 46, 49, 52, 55cm

Frame: Ritchey Logic (3 main tubes Prestige)
Wheels: 26" Ritchey V-Comp rims, Z-Max tires
Components: Shimano Deore XT/LX mix, Specialized Crank, Dia-Compe #987 brakes.

TOP NOTCH!

RB-1

The RB-1 is everything we think a road bike should be. The laid-back seat tube angle, deep-drop handlebars, and classic good looks make this the right choice for anyone interested in a fine, inexpensive, raceworthy road bike. The RB-1 costs around $1,000, but with Shimano Ultegra drivetrain, Dia-Compe brakes, Ritchey stem, rims, and tires, it's a steal.

First Year Made: 1988
Frame Built In: Japan
Production Quantity: 1,500
Sizes: 50, 53, 54.5, 55, 56, 57.5, 59, 62cm

UNRIVALLED

MB-6

SPOKED-N-STOKED

Frame:
Tange butted CrMo
Wheels:
26" Ritchey V-Sport rims, Megabite tires
Components:
Shimano 500LX & 400LX with Dia-Compe brakes

For a first good mountain bike that you won't outgrow as you polish your skills and your enthusiasm grows, you can't beat an MB-6.

Production Quantity: 10-12,000
Sizes: 38, 42, 46, 49, 52, 55cm

Frame: Three tubes CrMo
Wheels: 26" Araya rims, Cheng Shin tires, stainless spokes
Components: Shimano 300CX. Top-mount shifters

For casual rides, the BB-1 is perfect. Though it looks a lot like a mountain bike, the BB-1's frame is designed specifically for riding on pavement and fire roads. Note the top-mount shifters and round chainrings.

Production Quantity: 7,500
Sizes: 42, 43L, 46, 49L, 50, 56cm

SOONER BB-1 OR LATER

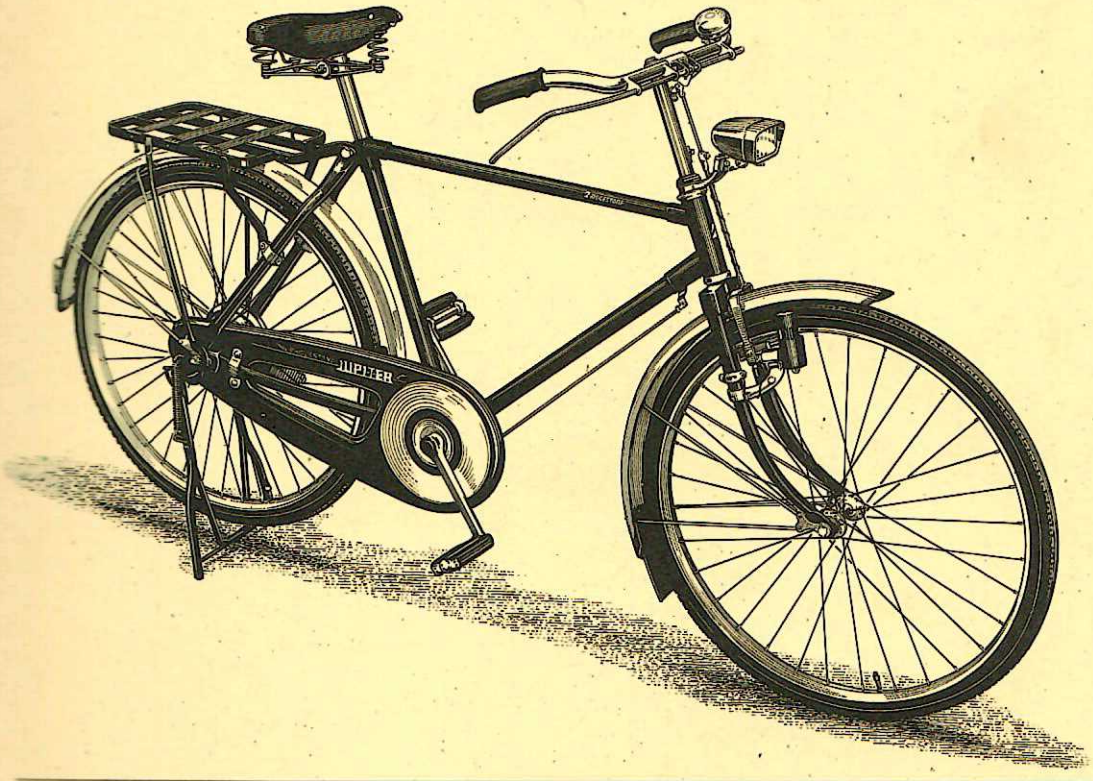
PEERLESS

XO-2

The XO-2's handlebar, brake, and shifter set-up are unique and smart. With 26" x 1.4" Ritchey road tires, Shimano drivetrain, and Dia-Compe brakes, this is our most versatile bike.

First Year Made: 1992
Frame Built In: Taiwan
Production Quantity: 3,500
Sizes: 42, 48,52, 55, 59cm

THE 1992 BRIDGESTONE BICYCLE CATALOGUE



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The 2.2 Percent Solution

THIS YEAR CLOSE TO TEN MILLION BIKES WILL BE SOLD IN THE UNITED STATES. Of those, about 2½ million will be sold by independent bike dealers; the rest, by mass merchandisers. There are 7,000 independent bike dealers in the United States; fewer than 400, or 5.7 percent of those dealers sell BRIDGESTONES. That's eight per state, average. Of the 2½ million bikes sold by those 7,000 dealerships, just 55,000—or 2.2 percent—are BRIDGESTONES. We have 29 competitors. So in the big picture (the total U.S. bike market), we're microscopic; and in our 30-team league, we're merely small. This has advantages.

For example, our small size allows us to be really particular about our bikes. We're large enough to matter to component makers (and it probably doesn't hurt that our parent company, BRIDGESTONE CYCLE CO., LTD., Tokyo, is Japan's largest bicycle manufacturer); but we're small enough so that our demand requirements are unlikely to exceed our suppliers' capacity—a situation that would certainly lead to compromising our specifications.

Though this next pronouncement may border on elitism or snobbery, we offer it simply as fact: We don't aspire to sell any of our bikes to a "typical bike buyer," and our lineup does not include "something for everyone." Here again, our small size allows us to choose the trends we want to pursue, to disregard the ones we disdain, and to be different when doing so will make a better bike. Having to sell only 1,500 of a particular model, for instance, gives us the latitude to make it special.

But this is not to say that BRIDGESTONE bikes have limited appeal. We've been accused many times of going our own way, but in all instances it's been for practical reasons that, more often than not, were ahead of their time.

In the arena of production mountain bikes, for example, the list of BRIDGESTONE "firsts" includes two-finger brake levers, sub-17-inch chainstays, 73/71-degree geometry, toe clips, narrow handlebars, and racing saddles—all of which have since become "industry standards." Likewise, we carried the torch for round chainrings, top-mount shifters, and cantilever brakes, even when it was not popular to do so. These examples are not rare, isolated, and carefully selected—they are typical. When we take a minority stance on a technical issue, we do so for sensible reasons. BRIDGESTONES are, if anything, sensible. We don't claim to sell excitement or a lifestyle. Excitement, as you well know, comes from riding; and your purchases shouldn't define your lifestyle.

A further benefit to our small size is that it gives us the freedom to select our dealers carefully. It's not our policy to give our sales representatives quotas for opening new dealerships. Rather, they have both the freedom and the luxury of seeking out the best dealers in any area, which is one reason why the quality of BRIDGESTONE dealerships exceeds, by a good margin, the industry average. (Two years ago more than 375 dealers applied for BRIDGESTONE dealerships; we selected 40.) The drawback to having so few dealers is that it's quite possible you'll have to leave town to find one.

We've seen to it that these bikes are worth the trip. Each of our new models earned its place in our lineup, and compared with other bikes in their use-category, each is without peer. Small as we are, we beat the giants. And all others.

How Our Bikes Are Spec'd

MOST PEOPLE ASSUME spec'ing bikes requires bike smarts and creativity. It doesn't. Bikes are spec'd mostly by ricochet, default, and stubbornness. Here's how it works.

DECEMBER-JANUARY: RUMORS AND CRUDE PROTOTYPES

We hear rumors about the new parts in December, and those rumors are confirmed or proved wrong in January, when we get faxes and visits from parts makers. Then we see crude prototypes, often handmade from wood or clay and usually labeled "no test," meaning "fondle gently, please." Sometimes the prototypes are modified existing parts, in which case we can ride them around our parking lot. The production parts don't yet exist.

EARLY FEBRUARY: RESERVING PRODUCTION TIME AND REVIEW

If we haven't reserved production time in the factories, we do so now. Then we review the current models, talk with our sales reps, review dealer comments, and decide what changes, if any, we should make.

LATE FEBRUARY-EARLY APRIL: SPEC'ING THE BIKES

We start out idealistic, ruling out nonround chainrings, painted cranks, and cranks with high Q-Factors. After reality sets in, it becomes clear where we have to compromise. The more costly the bike, the less often we compromise.

We find out what's really available, as opposed to what just happens to be on the parts makers' menus. Parts makers generally prefer not to make a part unless they get lots of orders for it; and if we're the only ones who order it, they may impose inconvenient ordering policies and delivery schedules, to guide us towards the same part everyone else is ordering. If we want the part badly enough, and we generally do, we put up with the restrictions.

Special parts made just for us are another story. Our success depends on timing (handlebars require less time than cranks) and our relationship with the maker. We generally bat about .650 in this game, but our strikeouts this year included cheaper bar-end shifters; bar-ends compatible with 16mm inside-bar diameters; low-priced, low-Q cranks; and, lastly, a left (front) top-mount shifter that downshifts on the forward stroke. Maybe next year.

THE E FACTOR

When the specs are 98 percent final, we review them looking for a reason or excuse someone might give for not buying a particular model. Usually it's something unusual about the bike. Examples this year include bar-end shifters on the RB-1 and the Moustache Handlebars on our XO-1 and XO-2. Any obvious, unusual spec requires more explaining and scares off timid customers. For this reason, we call these bikes "high-E bikes," and we seriously consider whether the functional advantage is worth the marketing risk. Usually it is, and our "high-E bikes" are the ones we're most proud of.

Everything about spec'ing encourages us to conform. Spec'ing bikes is like painting by number: There seem to be many choices, but on closer inspection you discover your limitations. Sometimes getting the bike to turn out the way you want it to means making up your own rules and hoping you can pull them off; but time restrictions and practicality often don't allow that, and our "first choice" is sometimes the least of several evils. Fortunately, many modern bike components work pretty well.

EENY, MEENY, MINY, MO/CATCH A TIGER BY THE TOE/IF HE HOLLERS LET HIM GO/
EENY, MEENY, MINY, MO.
MY MOTHER TOLD ME TO PICK THE VERY BEST ONE—

How To Buy A Bike

☞ SHOP FOR A DEALER, NOT A BIKE ☜

Manufacturers design and spec the bikes and pick the materials, then depend on dealers to assemble this mass of potential into a high-quality, trouble-free bike. Bikes are unique in this way; the quality of the ready-to-buy bike of any given model varies from dealer to dealer. The best advice we can give you is to find a dealer you like and trust and who has a good reputation.

PAY A LITTLE MORE

The best dealers take the time to assemble and adjust your bike properly, and charge you for it. A higher price is usually a good sign. The term "false economy" was invented for poorly assembled, heavily discounted bikes.

BUY SIMPLICITY AND PROVEN TECHNOLOGY

Simple things have fewer parts, fewer potential problems, are easier to repair, and give you more quality per dollar. First production runs are notorious for problems. When in doubt, wait for the sequel.

GET A COLOR YOU CAN LIVE WITH

Trendy colors are best for cheap things you can replace when fashions change, or when the color starts to turn your stomach. Remember, too, that a new paint job costs at least $110.

☞ A WORD ABOUT PRICES ☜

Up. Last year you could get a decent, modern, moderately lightweight, multi-speed bike for $300. In a '92 model the same $300 buys you an exercise in cost-down materials and manufacturing methods; a hollow image high on frills and features, low in quality. Such a bike is fine for basic utility rides and short commutes—and these are noble, legitimate uses indeed—but it's probably overgadgetized for these purposes, and in any case it is not suited to hard, long-term, athletic riding.

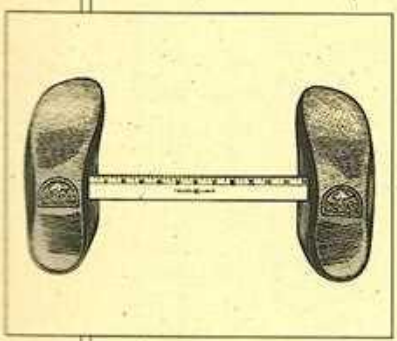
The least expensive 1992 BRIDGESTONES, our BB-1 and XO-3, typically cost between $380 and $400. We have some leftover CB-1's from last year, and they can be had for less. These are good bicycles.

Getting Sized and Fitted

Your correct frame size depends on the kind of bike, how and where you'll ride it, and even, to an extent, your culture. For instance, the Pennsylvania Dutch ride bikes that most of us would consider to be two to three inches too big; yet they've adapted to these "too big" bikes, and find them perfect for their big-gear, slow-cadence riding style. Most riders, however, prefer smaller frames.

FOOLPROOF FRAME-SIZING

Wearing cycling shoes or normal shoes–something other than heels–straddle the top tube with your feet 12" apart.



- On a mountain bike, your crotch should clear the top tube by 3 to 4".
- On a road bike it should clear by 1 to 2½".
- On a bike that's neither a mountain or a road bike, size it somewhere in between.

Generally, more athletic riding and rougher terrain require more clearance—for example, 4" on a mountain bike and 2½" on a road bike. There's a movement toward really undersized mountain bike frames with extra, extra long seat posts and stems. This stresses the frame unnecessarily and changes the bike's handling.

SIZING STEMS, HANDLEBARS, AND CRANKS

- Longer legs need longer cranks.
- Longer arms and torsos need longer stems.
- Broader shoulders need wider (drop-style) handlebars.

We match all these things to the frame size, so a box-stock BRIDGESTONE will most likely fit you pretty well. (For specific crank lengths, stem lengths, etc., on any given model and size, please refer to page 47.) Finally, if you want to change anything from the stock part, keep in mind that this is labor-intensive. Changing a stem length, for instance, means unwrapping the handlebars, trashing the tape, and undoing the brake and derailleur adjustments—which can easily take up to half an hour. Don't hesitate to change these details if they aren't perfect, but be willing to pay for it.

Manners for Off-Roadies

1

DON'T RIDE IN MUD.

2

IF YOU MUST RIDE IN MUD, don't ride in clay-based mud, which sticks to your tires and makes riding impossible anyway. You wreak the most trail damage on this type of mud.

3

IF YOU HAVE TO RIDE IN CLAY-BASED MUD, use tires from 1.25 to 1.4" with little or no tread. We ride Specialized Fat Boy™, Tioga City Slicker™, Tom's Slick, and Specialized Nimbus™—and they all work better than big, fat knobbies because they don't attract as much mud, and they're easy to wipe off.

4

DON'T SKID.
If you cannot descend without skidding, walk. If you can't corner without skidding, slow down. If you can't slow down...

5

BE QUIET.
Whoops and yelps and howls make you sound drunk, drugged, rowdy, threatening—or all four at once.

6

BE KIND TO ANIMALS.
Carry your bike past horses unless the rider tells you it's okay to ride. Don't let the freewheel click—some horses mistake a clicking freewheel for a rattlesnake. Don't scare cows, because scared cows run and are likely to trip.

7

WEAR COLORS COMMON IN NATURE.
Neons are fine for visibility in traffic, during deer season, and for beachwear, but they look out of place in the country. The idea is to minimize your impact not only after you've left, but also while you're riding. Bike magazine cover boys and cover girls are not good role models in this regard.

INTERNATIONAL MOUNTAIN BIKING ASSOCIATION MEMBERSHIP APPLICATION

A non-profit, volunteer group, IMBA's goal is to keep public lands open for recreational enjoyment of responsible off-roadies. It publishes *Land Access Alert* to keep members informed of current issues. Donations above $9 are tax deductible.

INDIVIDUAL MEMBERSHIPS (check one)

- ☐ BASIC MEMBERSHIP (Annual) $15
- ☐ MEMBER OF AFFILIATED CLUB (Annual) . . . $12
- ☐ SUPPORTING DONATION (Annual) $25
- ☐ SUSTAINING DONATION (Annual) $100
- ☐ FOUNDER DONATION (Lifetime) $1,000

Canada/Mexico add $5 for mailing.
Outside North America add $10 for mailing.

NAME

ADDRESS

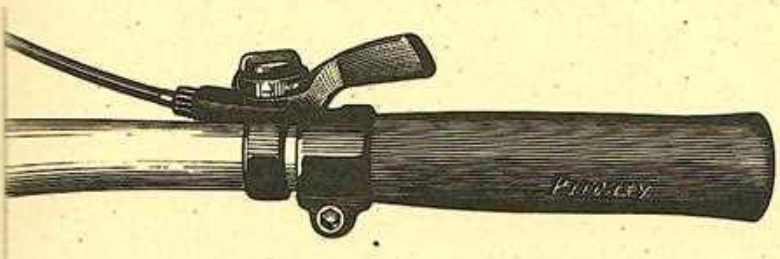
CITY/STATE/ZIP

PHONE: HOME

WORK

For bicycle dealer/shop, club and industry memberships, please contact IMBA. Make checks payable to IMBA and mail to Route 2, Box 303, Bishop, CA 93514.

Top-Mount Shifters vs. Underbar Shifters



SIMPLE, MINIMAL, RELIABLE

WEIGHT

Top-mounts weigh two to five ounces less than underbar shifters.

VERSATILITY

Top-mounts have a friction option and in the friction mode they work with any chain, freewheel, freehub, cable, and cable housing regardless of brand or country-of-origin.

Most underbar shifters don't have a friction option, so they work only with a narrow range of the same company's drivetrain components.

FUNCTION

Since top-mounts have only one shifter per side, not two, they are less confusing. It's easier to shift top-mounts with the heel of your hand—a benefit you'll appreciate when your fingers are cold and stiff or when you're wearing mittens.

PRACTICALITY

When underbar shifters are built into the brake lever, you can't position them independently, and if you crash and break either of them—or simply wish to upgrade—you must replace both. Since having a one-piece shifter/brake lever combination offers no functional advantage, we prefer keeping them separate.

AVAILABILITY

Underbar shifters are available in a wide range of prices and qualities, but top-mounts are scarce in the price and quality ranges appropriate for $350 to $600 bikes. This forces manufacturers who would like to spec top-mounts either to severely upspec or severely downspec, and is one reason there are so few top-mount shifters on bikes in this price range.

☛ Pro racers who are paid to use equipment will no doubt win a lot of races this year with underbar shifters, and you can read their testimonials in advertisements. It's possible that some racers prefer underbar shifters, but others use them as part of their promotional duties. Personally, we prefer top-mounts, so we spec them exclusively.

"DOUBLE, DOUBLE TOIL AND TROUBLE..." —*SHAKESPEARE, MACBETH*

IN ANYTHING AT ALL,
PERFECTION IS FINALLY ATTAINED NOT WHEN THERE'S NO LONGER ANYTHING TO ADD,
BUT WHEN THERE'S NO LONGER ANYTHING TO TAKE AWAY,
WHEN A BODY HAS BEEN STRIPPED DOWN TO ITS NAKEDNESS.
—*ANTOINE DE SAINT EXUPÉRY*

THERE ARE VERY FEW ACCOMPLISHMENTS OF ANY VALUE THAT CAN BE GAINED WITHOUT PRACTICE, AND THAT WHICH TAKES THE LEAST TIME TO LEARN IS USUALLY THE LEAST VALUABLE WHEN LEARNED.
-THE EAGLE BICYCLE CO. CATALOG, 1890

SINCE 1987 PEOPLE HAVE BEEN CALLING FRICTION SHIFTING OBSOLETE, ARCHAIC, IMPOSSIBLE TO SELL, DEAD—WHILE HERALDING INDEXING AS CYCLING'S SAVIOUR, THE SINGLE MOST IMPORTANT CYCLING DEVELOPMENT OF THE PAST QUARTER CENTURY AND THE SOLE REASON MILLIONS OF PEOPLE EVEN RIDE A BIKE. THESE DAYS MOST MOUNTAIN AND CITY BIKES DON'T HAVE A FRICTION-SHIFTING OPTION, AND NEW CYCLISTS ARE BEING RAISED ON INDEXING. WE THINK THAT'S BAD, BUT WE'RE EXTREMISTS IN THIS REGARD. IN ANY CASE, FRICTION FANS EVERYWHERE WERE STUNNED LAST YEAR WHEN SEAN KELLY (THE MOST SUCCESSFUL PROFESSIONAL ROAD RACER OF THE PAST 10 YEARS AND ALMOST A CULT HERO FOR TECHNOPHOBES) STARTED THE SEASON WITH INDEXING. OBEYING SPONSORS' ORDERS OR NOT, THAT'S LIKE BOB DYLAN FORGETTING THE WORDS TO "BLOWIN' IN THE WIND" OR RALPH NADER PUNCHING A TIME CLOCK FOR CHRYSLER. AND IT MAKES EVEN THE MOST STUBBORN FRICTION-SHIFTING FAN RE-EVALUATE THE REASONS FOR...

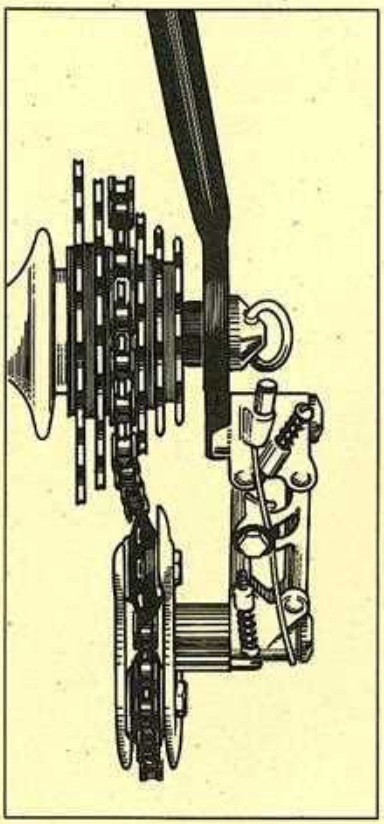
Friction Shifting In An Indexing World

Indexed shifters have click-stops which tell you exactly how much to move the shift lever to shift; and if everything is properly adjusted, you can't miss a shift. That's the appeal, but it's also the drawback. You learn *when* to shift, but since the mechanism shifts for you, you don't learn *how*.

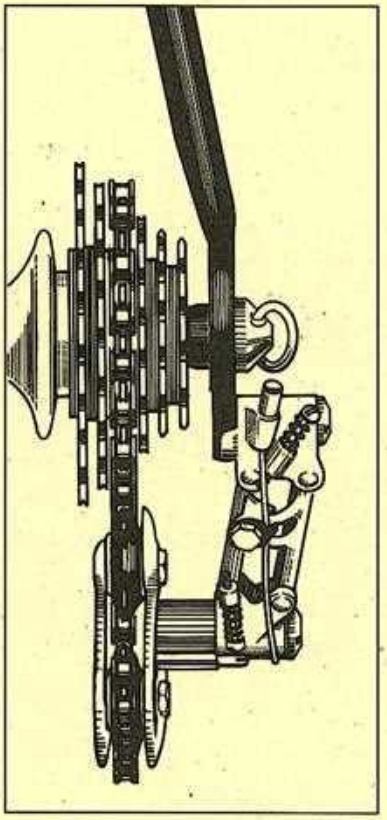
Friction shifting makes more clear the relationship between lever movement and derailleur movement, teaching you shifting concepts and fundamentals that will make you shift better with any type of shifter. This isn't of concern to experienced riders who were raised on friction shifting, but it should matter to beginners who wish to develop a valuable skill. Friction shifting isn't foolproof, but it doesn't graduate fools, either.

FRICTION SHIFTING IS AS EASY AS

Just move the lever until the chain engages on the cog you want. If you slightly overshift or undershift, you'll hear the chain rub, but pushing or pulling the lever a wee bit ("trimming") centers the derailleur directly beneath the correct cog and stops the rubbing. Sometimes on hills you have to "sneak in" a shift: Accelerate briefly, and when your left pedal is nearing the bottom of the stroke, shift. Then "float" the pedals until the shift takes, usually within a half-a-pedal revolution. You might not succeed on your first attempt, but it's not the headache the Indexing Brigade claims it is, either. With just a little conscious effort, your skills will improve rapidly.



CLICK-CLICK...KA-CHUNK! THE DERAILLEUR PULLEYS ARE NOT DIRECTLY BELOW THE ENGAGED COG. A MINOR PROBLEM, EASILY SOLVED.



SILENCIO... MOVING THE RIGHT SHIFTER *SLIGHTLY*—IN THIS CASE, TOWARDS YOU—SOLVED THE PROBLEM. THIS IS "TRIMMING." IT'S EASY.

FRICTION ROLLS WITH THE PUNCHES

Friction shifting works with every brand of derailleur, cable, housing, and gear cog ever made, from any country, in any combination. It's not nearly as sensitive as indexing to kinky cables, blown-out cable housing, creative cable routing, misaligned frames, wear and tear, and time. That's why you see old, cheap, beat-up, ugly bikes still shifting fine in friction. Friction shifting is tough and tolerant; it doesn't cry "foul!" when things aren't perfect.

FRICTION SHIFTING IS MORE HUMAN, LESS MECHANISTIC

Indexing makes you dependent upon the mechanism instead of yourself. When indexing fails for any reason, a friction option and your own shifting skills will bail you out.

FRICTION PUTS YOU IN CONTROL

You get the blame when you blow it and the satisfaction when you don't. And just as there are photographers who don't use point-and-shoot cameras, flyfishers who fish nymphs without bobbers, and cooks who shun microwaves, there are cyclists who enjoy the intimacy with their bike and the improvement of personal skills that friction encourages.

Observations and Opinions on Suspension

1

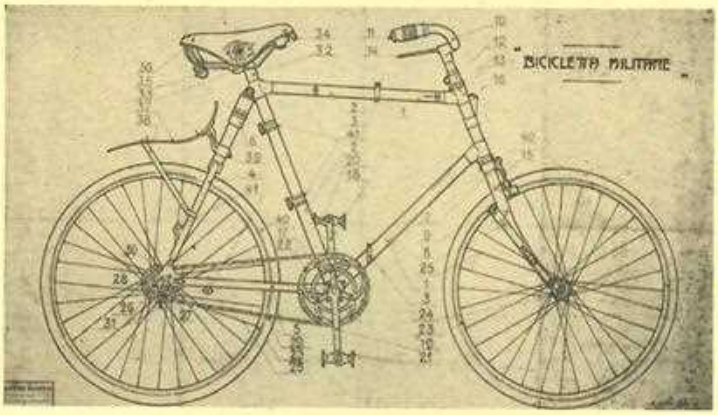
ALL BIKES HAVE IT. IT'S IN THE TIRES; AND BIG, FAT TIRES RUN AT LOW PRESSURE HAVE LOTS OF IT. EVEN STEMS, BARS, AND STANDARD FORKS ABSORB SOME SHOCK.

2

ALL PEOPLE HAVE IT. WHEN YOUR JOINTS FLEX, THAT'S SUSPENSION. WHEN YOU TRAIN YOUR JOINTS TO FLEX WITHOUT CONSCIOUS EFFORT, THAT'S TECHNIQUE. YOUR TECHNIQUE IMPROVES THE MORE YOU RIDE.

3

SOMETIMES YOU NEED MORE SUSPENSION THAN TIRES AND BODY JOINTS PROVIDE, WHICH IS WHY RUBBER BUMPERS, HYDRAULICS, AND SPRINGS EVOLVED. EACH HAS ITS ADVOCATES.



CIRCA 1915 BIANCHI MILITARY BIKE WITH FRONT AND REAR SUSPENSION.
COURTESY OF BIANCHI U.S.A., INC.

☞ THE RUBBER BUMPER PEOPLE list as their strong points simplicity, reliability, low cost, and no oil to leak.

☞ THE SPRING PEOPLE cite greater up and down travel than rubber bumpers, lower cost than hydraulics, and no oil leaks.

☞ THE HYDRAULIC PEOPLE say that rubber bumpers and springs don't dampen; they just compress under load, then deliver the energy back. They say only hydraulics truly *dampen* shocks.

☞ JOINING THE FRAY, some experts claim you need only front suspension, because front impacts are the ones you feel the most. Still other experts recommend front and rear suspension.

Many proponents of suspension have motorcycle backgrounds, and believe bicycle engineering and design is archaic—or at the very least, in dire need of updating.

Bicycle loyalists point out that since motorcycles weigh 450 pounds, good technique and cushy tires can't help much, so they need extra suspension; but bikes don't, since they are lighter.

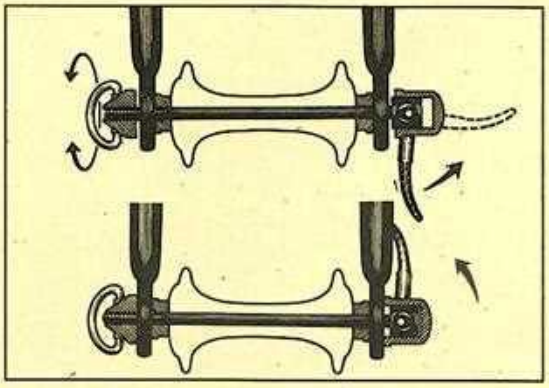
Undeniably there are trails, terrain, events, and riding styles that require something other than a standard bicycle to get the best results. But these situations are the exception, not the rule. For most riding, the important things to look for in a mountain bike aren't its capacity to neutralize bad technique in a boulderfield or shave seconds off a downhill time trial, but its ability to carry you safely and enjoyably over the trails you ride every day.

TECHNOLOGY IS IMPOSED ON THE LAND, BUT TECHNIQUE MEANS CONFORMING TO THE LANDSCAPE. ONE FORCES A PASSAGE, WHILE THE OTHER DISCOVERS IT. THE GOAL OF DEVELOPING TECHNIQUE IS TO CONFORM TO THE MOST IMPROBABLE LANDSCAPE BY MEANS OF THE GREATEST DEGREE OF SKILL AND BOLDNESS SUPPORTED BY THE LEAST EQUIPMENT.
—*DOUG ROBINSON, GREAT PACIFIC IRON WORKS CATALOG, 1974*

The Quick-Release and How to Use It

In America before the Bike Boom of '71 only racers and outcasts rode bikes, and only racing bikes had quick-release (q/r) wheels.

As competition between manufacturers heated up after the Boom, quick-release wheels found their way onto increasingly less expensive bikes. Now almost all decent bikes have q/r wheels, and the expanded pool of quick-release owners includes people who use it incorrectly and crash when the front wheel comes off. Often, they sue. Sometimes seven years after the fact. This is troubling.



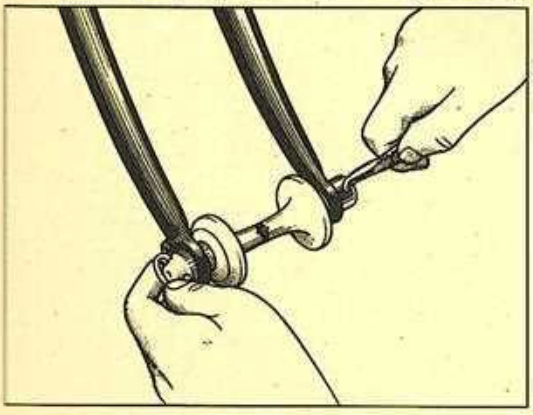
The q/r lever operates a cam. Tension is regulated by the opposite-side nut/cone.

In recent years most manufacturers have resorted to supplying their bikes with "positive front-wheel retention devices" (PFWRD) which negate all benefits of the quick-release. This measure is not meant to compensate for any deficiency in the q/r itself (only an act-o'-God can open a properly closed q/r during a ride); rather, its purpose is to prevent the wheel from dropping out of the fork *if the q/r is not closed properly.* The arguments against these devices are that they interfere with the critical contact between the hub and fork dropouts; they turn the quick-release into a "slow-release"; and that they give a false sense of security as well as discourage owners from learning how to use the q/r.

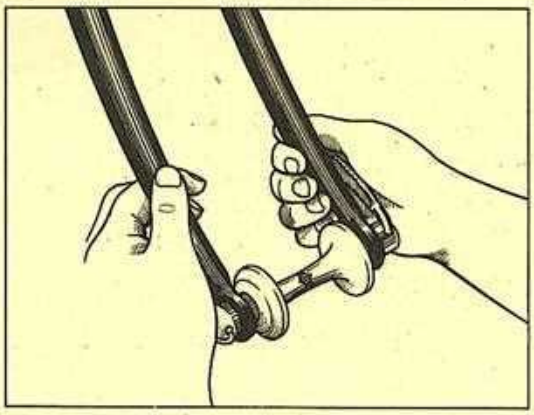
But the number of accidents is growing, and even manufacturers who are philosophically opposed to PFWRD's are now spec'ing them, albeit reluctantly.

The q/r is a boon to anyone who uses it correctly. The accompanying illustrations show how, but they are no substitute for the hands-on instruction your dealer will be happy to provide at no charge.

With or without a PFWRD, don't ride your bike without the q/r securely closed.



With the lever sticking straight out, screw the opposing cone in until it stops and there are no gaps between the dropouts and q/r.



It should require firm pressure to close the lever completely. Note the grip and the finished lever position. Do it right!

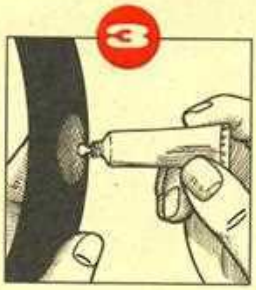
The Art and Science of Recycling Inner Tubes

THORNPROOF TUBES, tubeless tires, tire liners, and self-healing tubes are fine, but you'll never be completely comfortable on a bike until you can fix your own flats. Fixing flats is easy, and prevents waste.

You'll need: a leaky inner tube, tire levers, a patch, some glue, and a piece of sandpaper. (Get a repair kit.)

☞ Pry the tire off the rim, then remove and inflate the tube and find the leak. Two small holes suggest a pinch-flat, caused by riding underinflated tires over bumps.

☞ Abrade an area slightly larger than the patch. It's easier to abrade if you roll the flat tube around your pump. Discard the crumbs.



☞ Spread on a thin, even layer of glue. Be quick, not compulsive. Inflate the tube; escaping air will mark the hole. Then deflate it and let the glue dry completely.

☞ Holding the clear backing, press the patch over the puncture. To seal it tightly, rub a hard, smooth edge back and forth over the clear backing. A tire lever or spoon handle will do.

☞ Leave the clear backing on or peel it off from the inside out. Inflate to check for leaks. If it holds, put talc or dirt on the patched area to prevent excess glue from sticking to the tire. Putting talc all over the tube prevents time and heat from sticking the tube to the tire, too.

☞ Before putting the tube back in, check the inside of the tire for anything that may have caused the puncture. Put the inner edge (it's called the "bead") of the tire onto the rim, stick the tube in, and inflate it just enough to remove wrinkles. Starting from the valve, work both beads onto the rim simultaneously, pulling and stretching the tire as you go. Sometimes the last part is hard to remount. If so, use tire levers. The Var style (illustrated) works particularly well.

THE COST OF CONVENIENCE: A TYPICAL DISCHARGE FROM A CO_2 CARTRIDGE RELEASES THE SAME AMOUNT OF GREENHOUSE GASES INTO THE ATMOSPHERE AS DRIVING A CAR 100 MILES.

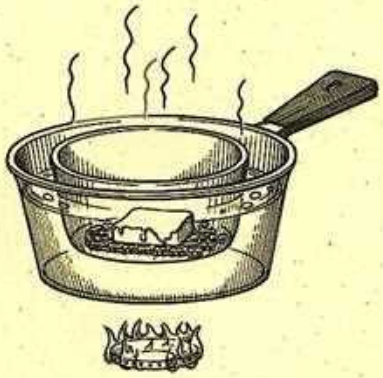
Alternative Methods of Chain Lubrication

1

WITH WAX

WAXING IS WONDERFUL. Everything the chain touches stays clean. You will need:

DOUBLE BOILER
Just a small handleless pot inside a larger pot.



1 LB. PARAFFIN
Grocery stores keep paraffin with the canning supplies. Note: We are experimenting with a beeswax/butter mix but the results aren't in yet. Pure beeswax is too sticky.

PROCEDURE

1. Degrease the chain with biodegradable solvent; dry thoroughly.
2. Fill the big pot with 3" of water, put the wax into the small pot, and put the small pot into the big pot. CAUTION: WAX IS FLAMMABLE; ALWAYS USE A DOUBLE BOILER.
3. Boil the water, which melts the wax so it's almost the consistency of water. Stir the chain to aid penetration.
4. Let it cool. When the wax is as thick as syrup, remove the chain with a spoke or piece of coat hanger bent in an "S". Hang it up to dry.

BREAK OFF THE CLINGING CHUNKLETS, work the chain a bit to make it flexible, and put it back on. It may skip in the first one to two minutes of easy pedaling, but it'll be ready to ride again after three or four minutes, and in dry conditions will last 400 to 700 miles. Best of all, everything the chain touches, from calves to derailleur pulleys, stays clean. After several rewaxing cycles the wax gets dirty and needs replacing.

NOTE: SHIMANO HYPERGLIDE CHAINS SHIFT WELL, BUT ARE TRICKY TO REASSEMBLE. LET A BIKE SHOP DO IT, OR SAVE YOUR WAX JOBS FOR STANDARD CHAINS.

2

PETROLEUM-FREE POSSIBILITIES

WE ARE NOT TRYING to infuriate chainlube manufacturers and we are not officially recommending this—but: Olive, sesame, or peanut oil, or hot, melted butter will keep your chain lubricated for at least 300 miles under dry road conditions. You can drip it onto the chain from a water bottle.

If you buy regular chainlubes and degreasers, insist on those that biodegrade and have minimal, recyclable packaging.

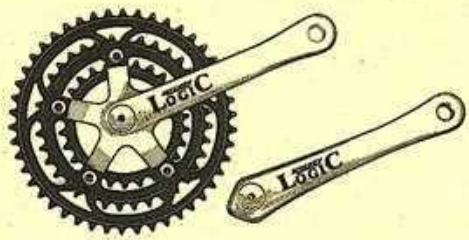
They cost no more than other chainlubes and degreasers, and most bike shops sell them.

JIM DANDY THROUGH AND THROUGH

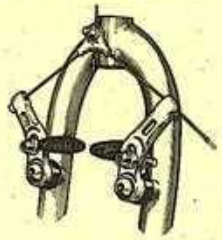
MB-1

This is our best mountain bike. It's light, strong, and always a favorite with racers who have to buy their bikes (as opposed to sponsored ones who get theirs free). This year's MB-1 has the latest versions of what we believe to be the best components of their type and price range: SunTour XC Pro derailleurs and shifters, Ritchey crank, SunTour MicroLite hubs, the cheap but strong SunTour Alpha freewheel, and Ritchey Z-Max tires.

☞ USES: Athletic off-road riding and racing; general transportation. Use road tires for pavement.
☞ COLOR: Pearl tusk



THE RITCHEY LOGIC™ CRANK IS LIGHT, STRONG, LOOKS GOOD, AND HAS A LOW Q-FACTOR.



DIA-COMPE'S NEW #987 BRAKES ARE LIGHT, HAVE A NEW CABLE CLAMP, AND LOOK BEAUTIFUL.

☞ TECHNICAL DATA

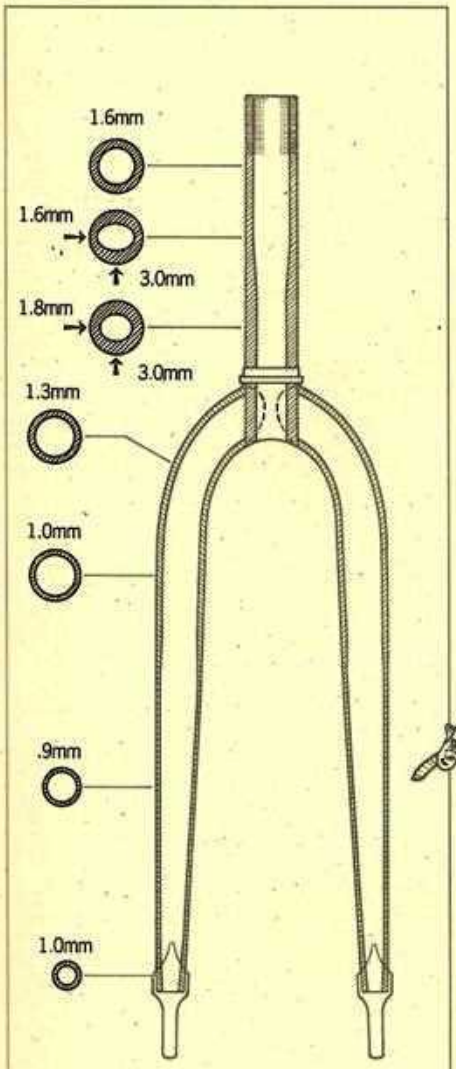
SIZES: 38, 42, 46, 49, 52, 55CM
FRAME WEIGHT: 4.4 LBS. (49CM)
FORK WEIGHT: 1.5 LBS. (49CM)
BIKE WEIGHT: 24.7 LBS. (49CM)

☞ UPGRADES FROM MB-2

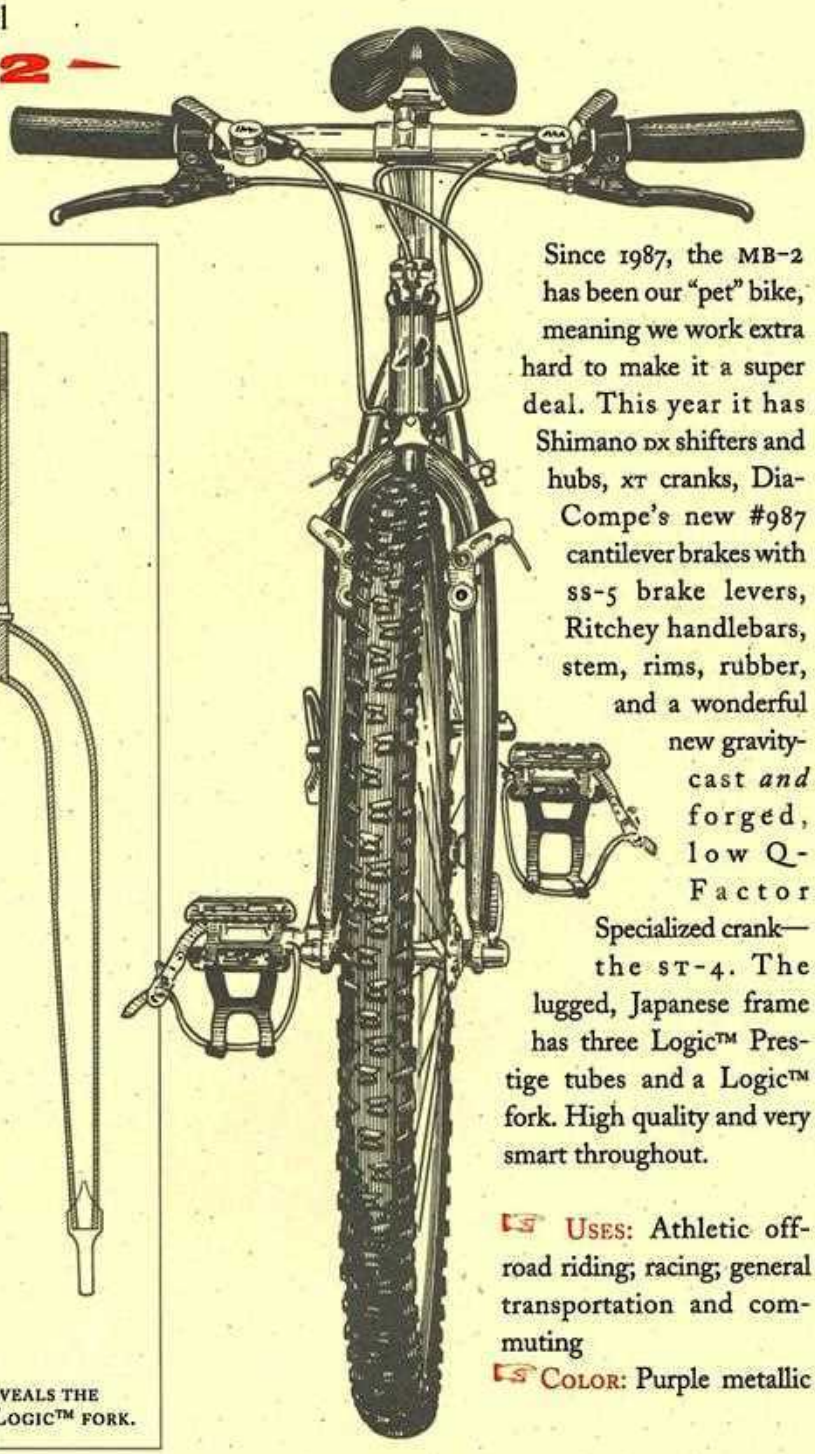
Ritchey crank has lower Q-Factor, more natural pedaling position.
Frame is full Logic™ Prestige, for less weight.
Kevlar beaded tires weigh less, accelerate faster.
Heat-treated stem weighs less.

ALMOST AN MB-1

MB-2



THE CROSS-SECTION REVEALS THE SECRETS OF THE RITCHEY LOGIC™ FORK.



Since 1987, the MB-2 has been our "pet" bike, meaning we work extra hard to make it a super deal. This year it has Shimano DX shifters and hubs, XT cranks, Dia-Compe's new #987 cantilever brakes with SS-5 brake levers, Ritchey handlebars, stem, rims, rubber, and a wonderful new gravity-cast *and* forged, low Q-Factor Specialized crank—the ST-4. The lugged, Japanese frame has three Logic™ Prestige tubes and a Logic™ fork. High quality and very smart throughout.

USES: Athletic off-road riding; racing; general transportation and commuting

COLOR: Purple metallic

TECHNICAL DATA

SIZES: 38, 42, 46, 49, 52, 55CM

FRAME WEIGHT: 4.6 LBS. (49CM)

FORK WEIGHT: 1.5 LBS. (49CM)

BIKE WEIGHT: 26.2 LBS. (49CM)

UPGRADES FROM MB-3

Specialized ST-4 crank has lower Q-Factor and weighs less.

Lugged, Japanese frame has 3 Logic™ Prestige tubes. Very expensive.

Ritchey WCS tires weigh less than standard tires.

Deore XT derailleurs, butted spokes, purple paint.

THE NEXT BEST THING TO AN MB-2

MB-3

In 1990 and 1991 the MB-3 sold out faster than any other model; and this year's MB-3 is the best ever, with Dia-Compe brakes, Shimano Deore DX derailleurs, Shimano DX hubs and shifters. If you can spend around $800 for a mountain bike, you won't do better than the MB-3.

☞ USES: Off-road riding and racing; general transportation and commuting
☞ COLORS: Red or blue

☞ TECHNICAL DATA

SIZES: 38, 42, 46, 49, 52, 55CM
FRAME WEIGHT: 5.0 LBS. (49CM)
FORK WEIGHT: 1.5 LBS. (49CM)
BIKE WEIGHT: 26.7 LBS. (49CM)

☞ UPGRADES FROM MB-4

Ritchey Logic™ CrMo frame tubes
Ritchey Logic™ fork
Deore DX drivetrain
Dia-Compe #986 brakes

LOW Q-FACTOR; LOW PRICE

MB-4

A good choice for part-time racers or anyone else who wants the best mountain bike available for around $650. The MB-4's unique mix of Shimano, Dia-Compe, Sugino, and Ritchey parts makes it our product manager's personal favorite. This is the one we recommend to close friends and relatives. Unless you blossom into a famous racer, you won't outgrow this bike's capabilities.

☞ USES: Off-road riding and some racing—possibly sport class to expert; general transportation and commuting

☞ COLORS: Dark blue metallic or pearl white

☞ TECHNICAL DATA

SIZES: 38, 42, 46, 49, 52, 55CM

FRAME WEIGHT: 5.3 LBS. (49CM)

FORK WEIGHT: 1.75 LBS. (49CM)

BIKE WEIGHT: 27.6 LBS. (49CM)

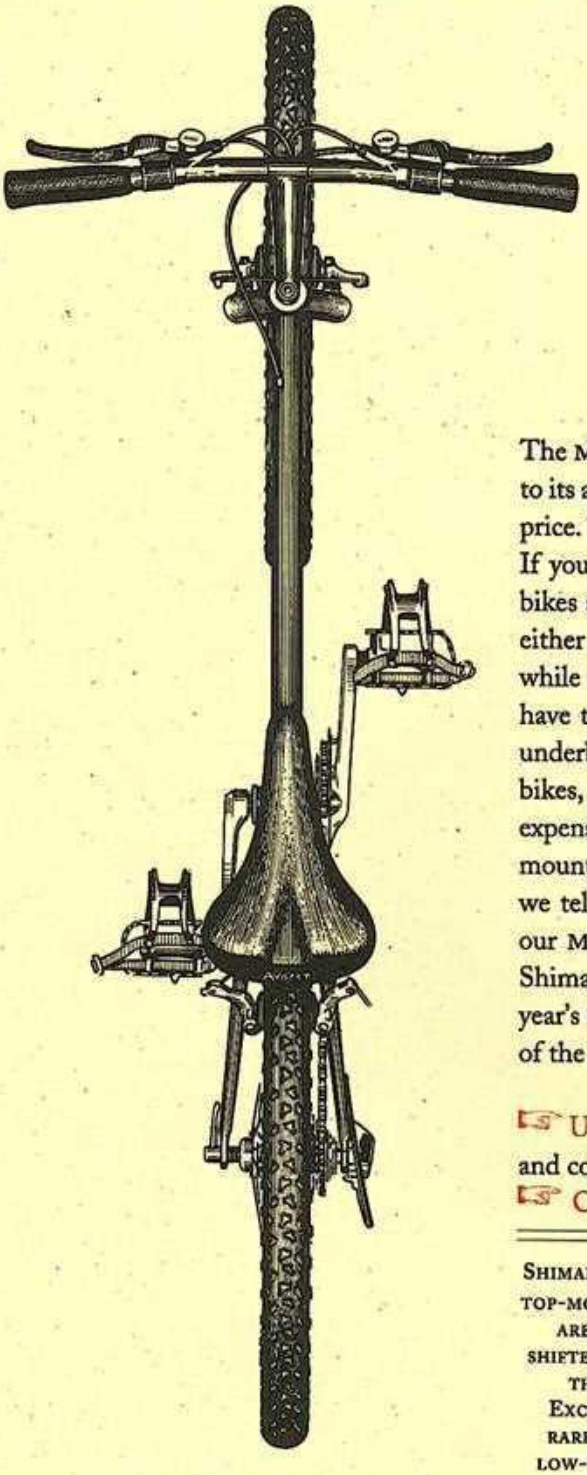
☞ UPGRADES FROM MB-5

Sugino crank has lower Q-Factor and weighs less

Better and lighter brakes and levers (Dia-Compe X-1 and SS-5)

Ritchey bar and stem

Wheelsmith spokes



A TOP VIEW OF THE MB-5

The MB-5 is slightly lighter than the MB-6, largely due to its aluminum chainrings—a rare treat on bikes of this price. The top-mount shifters are another unusual spec. If you look around, you'll notice that most mountain bikes selling for less than $600 have underbar shifters, either Shimano's Rapidfire™ or SunTour's X-Press™, while the same manufacturers' more expensive models have top-mounts. This might lead you to believe that underbar shifters are somehow better for low-priced bikes, while top-mount shifters are better for more expensive bikes. Actually, we strongly believe that top-mounts are better, period, and on page 7 of this catalogue we tell you why. This year the top-mount shifters on our MB-5 are Shimano MT-625's, bike spec'er talk for Shimano Deore DX. These are the same shifters as on this year's MB-3, and they are far more costly than the price of the MB-5 would ordinarily warrant.

☞ USES: Off-road riding; general transportation and commuting

☞ COLORS: Dark green metallic or red

SHIMANO DEORE DX TOP-MOUNT SHIFTERS ARE THE SAME SHIFTERS WE USE ON THE MB-3. EXCELLENT AND RARE ON SUCH A LOW-PRICED BIKE.

☞ TECHNICAL DATA

SIZES: 38, 42, 46, 49, 52, 55, 58CM

FRAME WEIGHT: 5.5 LBS. (49CM)

FORK WEIGHT: 1.75 LBS. (49CM)

BIKE WEIGHT: 28.7 LBS. (49CM)

☞ UPGRADES FROM MB-6

Lighter, 32-hole wheels

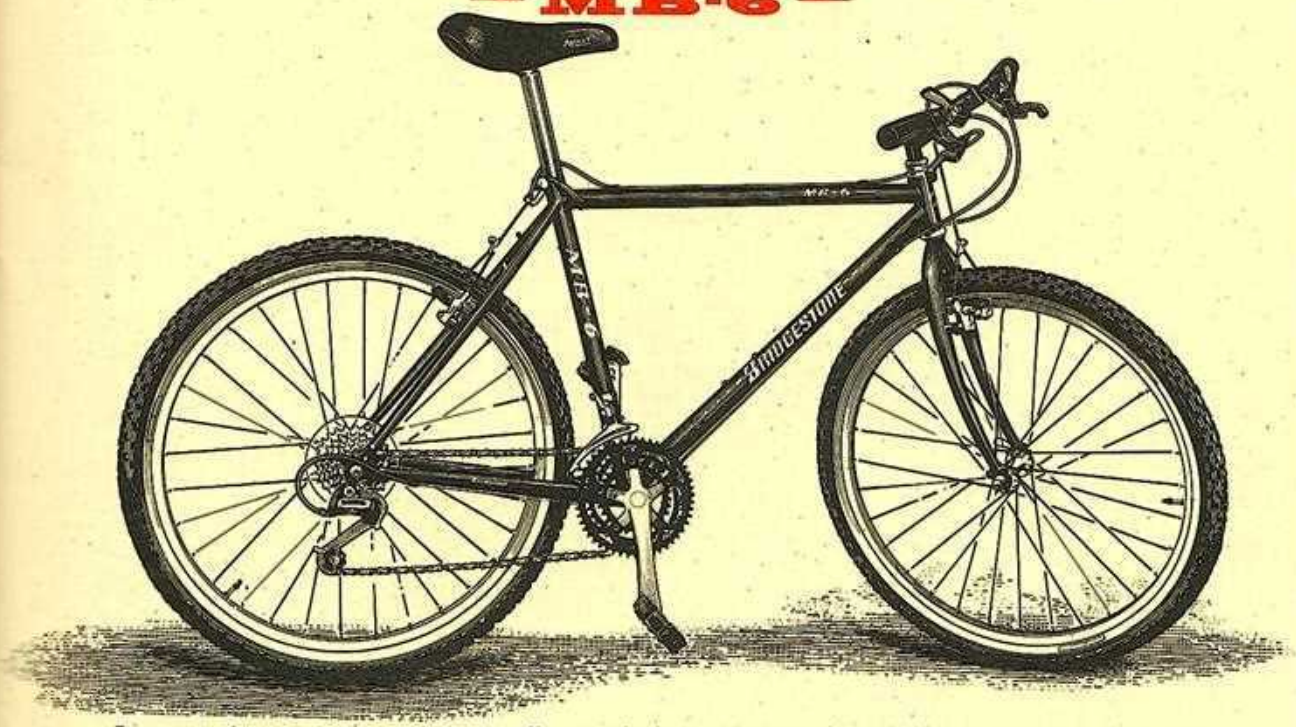
Aluminum handlebars and chainrings

Better and lighter shifters

Cable hanger on headset instead of through stem

OUR MOST POPULAR MODEL

MB-6



Last year the MB-6 was our biggest seller, maybe because it was the only bike in its price range with top-mount shifters. At this writing we can't say if that will again be the case, but the MB-6 has more to offer than just good shifters. It has the same geometry and ride as our most expensive models, and just a fraction of the cost-saving tricks found on other mountain bikes in this price range. The only thing remotely unhip about it is its lack of toe clips and straps. If you ride off-road, and enjoy keeping your feet on the pedals on bumpy descents, spend another $10 or so and put them on yourself.

☞ USES: Off-road riding (with toe clips); general transportation and commuting
☞ COLORS: Dark red or dark black

TOP-MOUNT SHIFTERS ARE A RARE TREAT ON A LOW-PRICED MOUNTAIN BIKE..

RITCHEY TIRES, STAINLESS STEEL SPOKES, PRESTA VALVES—ALL EXCEPTIONAL FEATURES ON A BIKE IN THIS PRICE RANGE.

☞ TECHNICAL DATA

SIZES: 38, 42, 46, 49, 52, 55CM
FRAME WEIGHT: 5.5 LBS. (49CM)
FORK WEIGHT: 1.75 LBS. (49CM)
BIKE WEIGHT: 29.3 LBS. (49CM)

☞ DIFFERENCES FROM BB-1 & CB-1

Full CrMo frame and fork, suitable for lots of off-road riding
Geometry and parts detailing more suited to off-road riding

AN UNFAVORABLE REVIEW IN AN INFLUENTIAL MAGAZINE CAN NEUTRALIZE THE BEST DESIGN, THE BEST SPEC, ANY ADVERTISING CAMPAIGN. NO MANUFACTURER WANTS TO MAKE A MAGAZINE'S HIT LIST; SO TURNING THE TABLES ON THEM, AS WE'RE DOING HERE, MIGHT BE FOOLISH. HOWEVER, IT'S BEEN A LONG TIME COMIN'...

beRating the Rags

BICYCLING

133 E. MINOR, EMMAUS, PA 18049; SUBSCRIPTION $19.97/12 ISSUES; CIRCULATION ABOUT 375,000. BICYCLING PLUS MOUNTAIN BIKE $29.97

According to the company profile, the readers are "fast recreational riders," and new cyclists and weekend warriors will learn a lot from *Bicycling*. There's some friction between us, however, dating back to the July '90 issue, when it unflatteringly called us "retro-grouches" and accused us of stifling techno-progress by not spec'ing many of the new components whose main benefit seemed to be that they were new. We disagree with *Bicycling's* view that cycling's major attraction to new riders is new technology. Overall *Bicycling* is well-written, occasionally stimulating, and it deserves praise for its role as a leader in cycling advocacy.

BICYCLE GUIDE

711 BOYLSTON ST., BOSTON, MA 02116; SUBSCRIPTION $14.90/9 ISSUES (TIP: GET A BLOW-IN CARD FROM ANY ISSUE AND PAY HALF PRICE); CIRCULATION 165,000.

In June '84 six editors and two ad salespeople from *Bicycling* quit to start *Bicycle Guide* as a general interest magazine for riders who wanted more nitty-gritty than *Bicycling* provided at the time. The focus hasn't changed much since; *Bicycle Guide* is written for people who already know a fair amount about bikes and don't require a lot of hype to maintain their interest. Criticisms: The covers are too glitzy for our tastes, and the vocabulary is at times a bit challenging. One of these days we'll look up "nascent" and "extant." But not today.

MOUNTAIN BIKE ACTION

10600 SEPULVEDA BLVD., MISSION HILLS, CA 91345; SUBSCRIPTION $14.98/12 ISSUES; CIRCULATION 64,000.

Mountain Bike Action is the most outspoken of the cycling publications, and it sometimes states opinions as facts, a combination that frequently gets it into hot water with advertisers and industry people who don't share its opinions. *MBA's* parent, High Torque Publications, also publishes *Motocross Action* and *Crash and Burn*, and the influence is unmistakable. *MBA* doesn't tolerate road-bike traditionalism, and it fawns over gadgetry too much for our tastes, especially if the gadget has motocross roots. On the plus side, *MBA* is frequently the only publication to take on a controversial issue, and its disregard for advertisers' feelings is refreshing, if sometimes misguided.

MOUNTAIN & CITY BIKING

BOX 16149, NORTH HOLLYWOOD, CA 91606; SUBSCRIPTION $12/12 ISSUES; CIRCULATION 35,000.

Last year *MCB* said of our bikes, "You either love 'em or you hate 'em!", a statement that left us bewildered—and required some explaining to our parent company in Tokyo. In any case, we think the tag is more self-descriptive. For our taste, *MCB'S* editorial is too chatty, it overuses quote marks and exclamation marks, it's too quick with praise, and it rivals *MBA* in its use of flash-frozen, neon-clad Southern Californians wearing brand new cycling togs and expensive plastic sunglasses. However, it has improved a lot in the past two years, and John Olsen's technical column—if you can get past his silly nickname-o'-the month—is quite good.

ADVERTISING... PERSUADING PEOPLE TO BUY THINGS THEY DON'T NEED, WITH MONEY THEY DON'T HAVE, IN ORDER TO IMPRESS OTHERS WHO DON'T CARE, IS PROBABLY THE PHONIEST FIELD IN EXISTENCE TODAY.
—VICTOR PAPENEK, DESIGN FOR A REAL WORLD

About Our Advertising

WE WRITE OUR OWN ADS. We try to have fun with them, but we recognize that they are our only direct communication with you, so we take them seriously and keep them as honest and hyperbole-free as possible.

We lay out the ads on a Macintosh II CX computer with Aldus Pagemaker software. To create a new ad, we call up an old one, write over the copy, and save it as a new one. This works for us because we keep the same ad formats ad after ad, year after year. Our 1992 ads will have a new look, but the same format. It's convenient, and easy enough for us to do in-house.

Occasionally our ads elicit hate mail. Usually it's when we show a helmetless rider, and the critic accuses us of having a disregard for human lives. And last year when a rider/model in an ad had red fingernails, lots of people accused us of sexism. To set the record straight, we care about human lives; most of us wear helmets most of the time; we are not sexist; and we don't yet have a firm policy against fingernail polish.

ADVERTISING SIGNS THAT CON YOU INTO THINKING YOU'RE THE ONE
THAT CAN DO WHAT'S NEVER BEEN DONE
THAT CAN WIN WHAT'S NEVER BEEN WON
MEANTIME LIFE OUTSIDE GOES ON ALL AROUND YOU.
—BOB DYLAN,
IT'S ALL RIGHT, MA (I'M ONLY BLEEDIN')

ABOUT THIS CATALOGUE

It's printed on Domtar brand "Sandpiper," which is made from 100 percent post-consumer waste paper. The term "post-consumer" describes paper that has already been used, as opposed to "pre-consumer" waste—printer's trimmings that haven't left the printer's, but nonetheless qualify a paper as "recycled." Sandpiper paper has not been de-inked because de-inking pollutes. The small dots you see are redistributed ink from the original paper. (For more information on this paper, fax a request to 516-365-2726.)

The catalog is printed with soy-based ink, as opposed to petroleum-based ink. This further reduces pollution, though to be honest, the substitution is only about 12 percent. (More than that and the ink doesn't dry well. But they're working on it.)

We hope to print all our consumer ads on the same paper, and to discourage waste, we've tried to make this catalogue a keeper. In any case, it is recyclable.

YOUR ADVERTISING HAS ASSURED ONE THING: I'LL NEVER OWN A BRIDGESTONE BICYCLE.
(D.K., LOS ANGELES... DIDN'T LIKE US REFERRING TO GEEKBARS AS GEEKBARS IN AN RB-1 AD)

ELEVEN OUT OF ELEVEN RIDERS AGREED THAT YOUR AD IS REALLY DUMB. ONE WAS EVEN A DOCTOR.
(NAME WITHHELD, COLORADO POSTMARK)

BRIDGESTONE ADS ARE THE BEST IN THE BUSINESS.
(J.M.K., M.D., SHELBURNE, VT)

Choosing Appropriate Technology

YEARS AGO PRO RACERS AND NONRACERS rode equipment that was similar in concept, if not cost, and the equipment knowledge gained in races carried over to recreational equipment. But in the specialized world of modern racing, equipment plays a bigger role than ever before, and many modern frames and components are being designed specifically for a competitor's special needs. These innovations are not always right for recreational riders, no matter how fit or fast. In the real world of weekend rides and commuting to work and school, a component designed to shave seconds in time trials, though glamorized in pro racing, may not be your best choice.

RETHINKING PERFORMANCE

There is so much emphasis these days on racing, winning, and achieving one's personal best. In fact, a lot of people define performance only in terms of speed and physiology. But real performance includes fundamental all-around skills like shifting, braking, cornering, and threading your way across town and through traffic safely, legally, and without scaring anybody. Performance is more than aerobics, aerodynamics, biomechanics, and computer readouts.

Good Business or Good Design?

MOST NEW BICYCLE and component designs are aimed at new and would-be cyclists because, as a group, they spend the most money. There's a problem here, though. When attracting new people to a sport, one uses the universal appeals of convenience and instant results. Often, qualities such as durability, repairability, and interchangeability are lost on new riders. You don't value repairability until you break something or wear it out. Most new cyclists, quite understandably, can't yet appreciate this.

BEWARE OF "USER-FRIENDLY"

"User-friendly" usually means "easily learned and mastered," and the "mastery" is achieved by the mechanism itself. All you need do is push a button, which activates a Rube Goldbergian chain of events hidden by a plastic console. The idea is that you can then concentrate on the task at hand, usually maximizing your personal potential. The pleasure of interacting with simple tools notwithstanding, the problem with these parts is that they're hard or impossible to repair, because repairability wasn't a design criterion.

WHY REPAIR WHEN REPLACING COSTS LESS?

When parts are cheaper to replace than repair, a repairperson's skills are artificially devalued, no longer worth passing onto others, and eventually become extinct. Repairing saves resources, reduces pollution at its main source—manufacturing—and recycles functional equipment, rather than sending it to our bulging landfills.

Buy things that are repairable. Look for metal instead of plastic, bolts and screws instead of rivets, simplicity rather than complexity.

Wonderful Wool for Beautiful People

IS YOUR CYCLING JERSEY PETRO OR RETRO?

YOU CAN WEAR a wool jersey for five straight days of two-hour rides, and the armpits still won't stink. Synthetics, on the other hand, stink to high heaven after one ride, and after two they're revolting. Test this yourself.

WOOL CYCLING JERSEYS LAST A LONG TIME

Just as the best and most durable rugs are wool, so, too, are the best jerseys. With regular use and normal care, a fine wool jersey should last you at least five years. (Mothballs are toxic, by the way; if moths are a problem, use cedar.)

A WOOL FIBER HAS OVERLAPPING SCALES WHICH TRAP DIRT NEAR THE SURFACE, WHERE IT IS EASILY WASHED OUT.

NO WARS FOR WOOL

People fight over sheep, but not to the extent that they fight over oil. Synthetics are made from oil.

WOOL IS VERSATILE

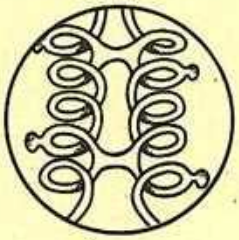
Wool has a tremendous comfort range, and compared with synthetics, is much less dependent upon layering to be comfortable in wide temperature ranges. A single layer of wool can substitute quite nicely for a synthetic layering system. Of course you can layer over wool, too, but so often it's not necessary.

A wool jersey makes a cozy pajama top, yet it's appropriate attire in the fanciest grocery stores, most restaurants, and on any mountain. A fine wool jersey is a versatile garment even if you don't ride a bike.

THE ORIGINAL HIGH-TECH FIBER

WASHING AND DRYING WOOL

Since wool doesn't stink and cleans itself, you don't have to wash it so often—which means you spend less time, energy, and water caring for it. Wash it in the shower, the machine, or the sink. Use mild soap (not detergent), agitate gently, rinse well, squeeze out the excess water (if using a sink or shower); then roll it in a towel, stomp on it, and hang it out to dry.



EACH WOOL FIBER HAS A SPIRALLING CRIMP WHICH LETS IT STRETCH, THEN BOUNCE BACK LIKE A MINIATURE SPRING.

It's 1992—Do You Know What Your Q-Factor Is?

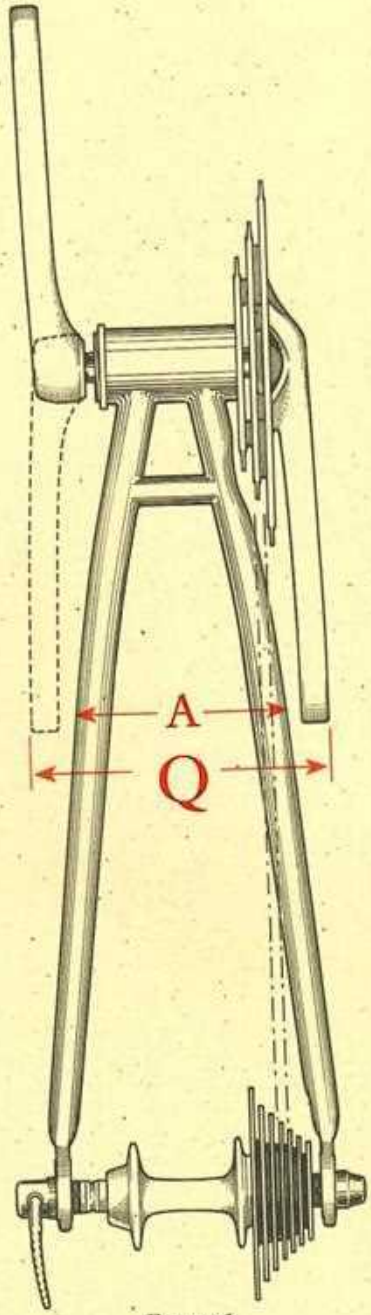
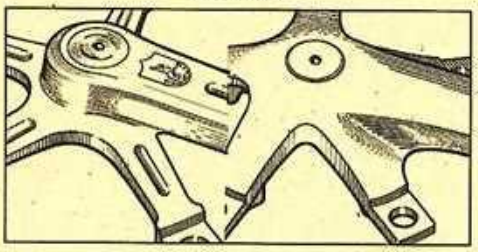


FIGURE 1

Q-FACTOR IS THE DISTANCE BETWEEN THE OUTSIDE OF THE CRANKS AT THE PEDAL HOLE. IT DETERMINES HOW FAR APART YOUR PEDALS ARE, WHICH IN TURN DETERMINES HOW FAR APART YOUR FEET ARE WHEN YOU PEDAL, WHICH OF COURSE AFFECTS AERODYNAMICS, BIOMECHANICS, AND PEDALING *FEEL*.

Five years ago a typical touring or mountain bike Q-Factor was 154mm. Most modern triples are about 162mm, and some prestigious ones go as high as 182mm.

FIGURE 2



LEFT: COLD-FORGED CRANK TYPICALLY HAS SMALLER RADIUS, LOWER Q.
RIGHT: MELT-FORGED CRANK HAS LARGE RADIUS, INCREASING Q.

WHAT HAPPENED?

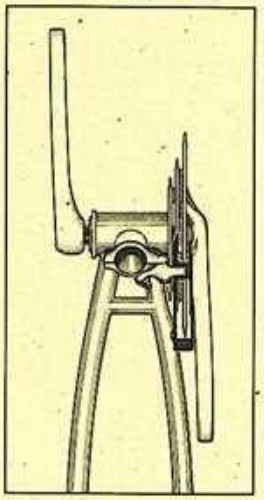
First, unfavorable currency exchange rates have made it necessary to reduce crank manufacturing costs in order to meet certain "price points." To maintain strength with less costly materials and methods, thicker crank arms and larger radii between the crank arm and the spider have become necessary; these increase Q. (See Figure 2.)

Second, some modern front derailleurs are so wide they require a chainring-to-crank arm gap of 13.5mm. (On older cranks this gap was as small as 7mm.) A bigger gap, increases Q. (See Figure 3.)

Third, increasingly wide rear overlocknut dimensions require that the front sprockets be set out farther from the seat tube—to keep the chain angle reasonable—and this leads to higher Q-factors. The first mountain bikes had 126mm overlocknut dimensions; this climbed to 130mm (we stayed there), and now most are at 135mm or 140mm.

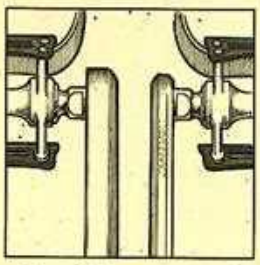
Spacing the rear cogs farther outside encourages manufacturers to move the chainrings farther outside, too—to keep a good chainline. This is done with a longer crank spindle, and increases Q-factor.

FIGURE 3



MODERN "WIDEBODY" FRONT DERAILLEUR DOESN'T FIT WELL BETWEEN THE CRANK ARM AND CHAINRING OF A LOW-Q CRANK. SOLUTION: NARROWER FRONT DERAILLEURS!

FIGURE 4



LEFT: MELT-FORGED CRANKS ARE THICK, INCREASING Q.
RIGHT: COLD-FORGED CRANKS ARE SKINNY, KEEPING Q LOW.

Finally, the chainstays on many modern bike frames are wide at the point by which the crank arms pass. (See A, Figure 1, facing page) Crank makers like their cranks to clear all frames, so they design up to 10.5mm of offset in the crank arms—measured vertically from the dustcap to the outside pedal hole. This increases the Q-Factor.

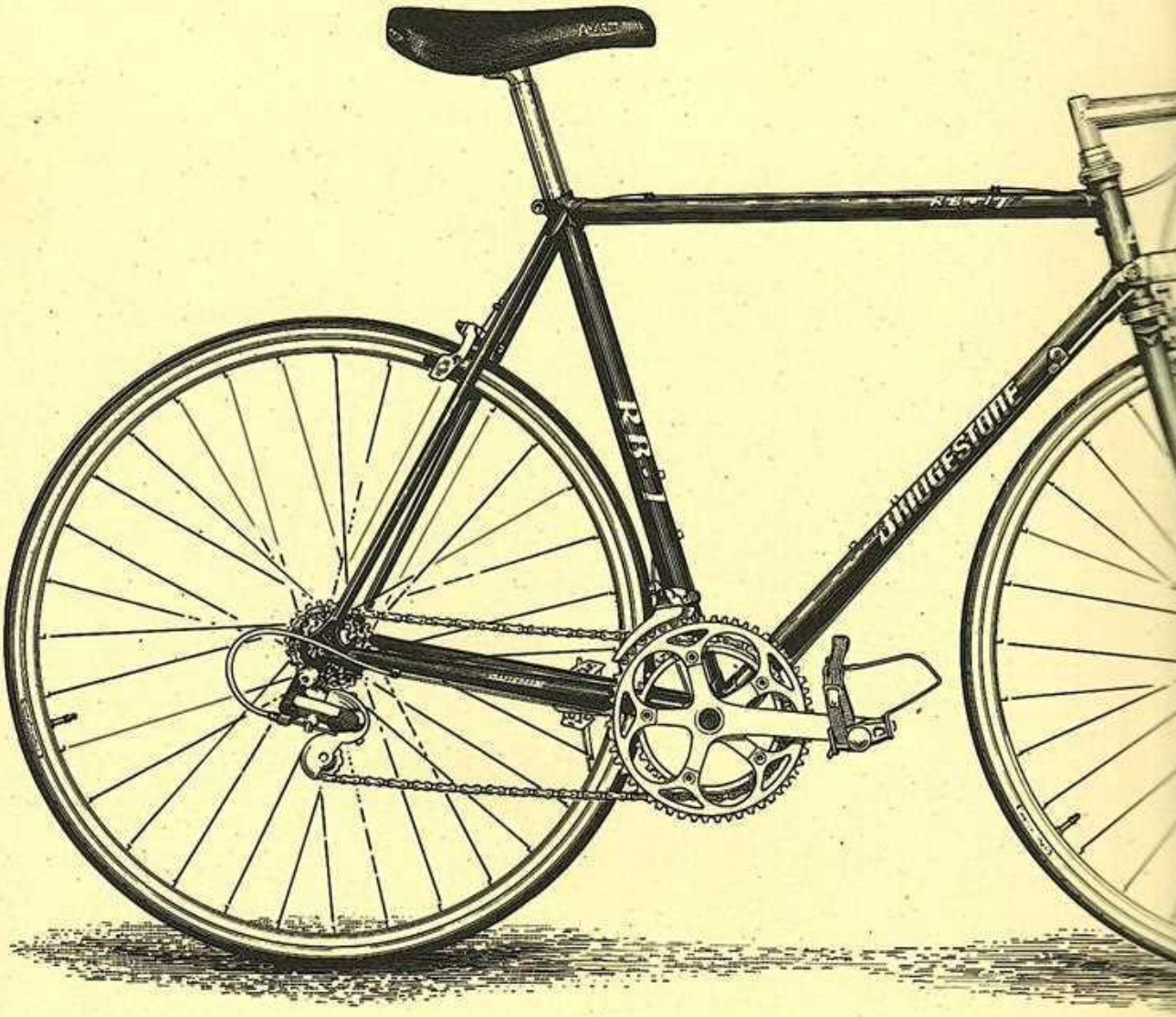
CAVEAT FOR SHORT RIDERS!

For any given Q-factor, a rider with shorter legs is more spread-legged than a rider with longer legs. Logic suggests that pedaling with your feet farther apart isn't as aerodynamic or as powerful as pedaling with your feet closer together, and our experience suggests that you can hurt your knees by riding with your feet too far apart.

Years ago custom bicycle builders in Japan recognized the merits of a low Q-Factor, and selected the narrowest cranks—usually the French T.A. brand—for their short-legged customers. At the turn of the century in England and America, the pedal-to-pedal distance was known as "tread," and a narrow "tread" was highly prized. "Q-Factor" isn't a new concept, just a highly ignored one. The media is doing a fine job of keeping the "Q-Factor" issue alive, and crank design should improve in the next few years.

THE PROVEN, LONG-LASTING ALTERNATIVE TO CARBON-FIBER

RB-1



TECHNICAL DATA

SIZES: 50, 53, 54.5, 56, 57.5, 59, 62CM

FRAME WEIGHT: 4.2 LBS. (56CM)

FORK WEIGHT: 1.3 LBS. (56CM)

BIKE WEIGHT: 22.5 LBS. (56CM)

COLORS

RED OR YELLOW AND WHITE

UPGRADES FROM RB-2

Lighter frame and seamless tubing

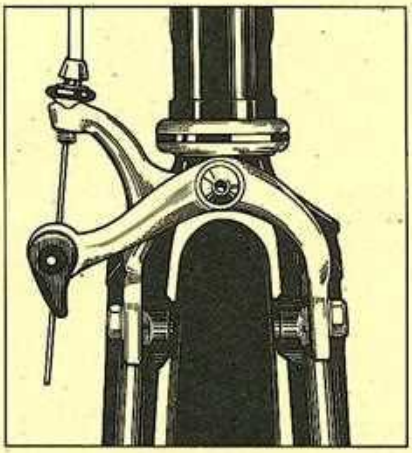
Lighter fork, with investment cast crown

Ritchey stem

Ultegra drivetrain

Leather saddle

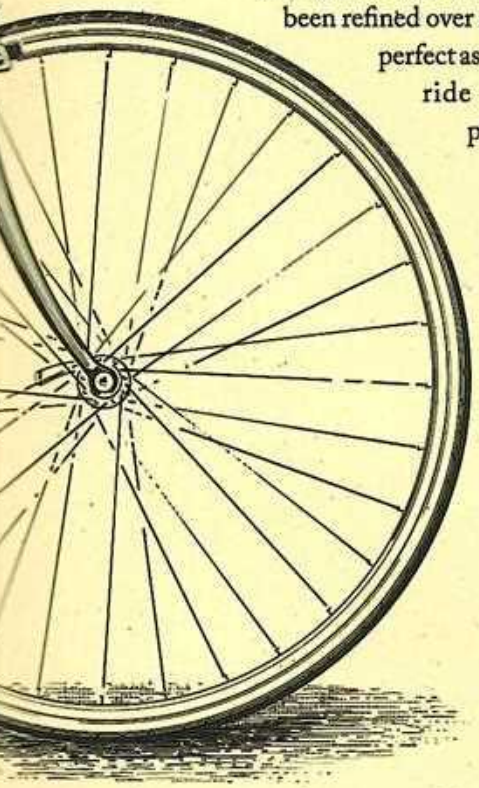
Lighter wheels, Wheelsmith spokes



MOST RACING FRAMES DON'T ACCEPT FAT CLINCHERS. THE RB-1 IS MORE VERSATILE BECAUSE IT DOES.

We believe that in the past two years the RB-1 frame has been ridden to more U.S. amateur victories than any other production frame. We know full well that riders, not bikes or frames, win races; but the RB-1 frame is all the frame any rider needs.

The RB-1 is the best-handling production bike you'll ever ride; and unless your body proportions are extreme, a custom builder will be hard-put to improve on it. The geometry has been refined over many years, and now it's as perfect as we can make it. If you must ride a domestic handbuilt, please feel free to take the RB-1 geometry to your custom builder for approval.



This year the RB-1 is equipped with Shimano Ultegra components, except for the brakes, which are Dia-Compe 300. We much prefer these traditional, high-quality, lightweight brakes to the newer, heavier, dual-pivot sidepulls.

WHAT? HANDLEBAR-END SHIFTERS?

Until we tried them six years ago, we thought bar-end shifters were only for elderly tourists. We've been riding them for five years now, and finally have the nerve to spec them on a bike. They take a ride to get used to; and as many an elderly tourist will tell you, they're wonderful.

WHY NO CLIPLESS PEDALS?

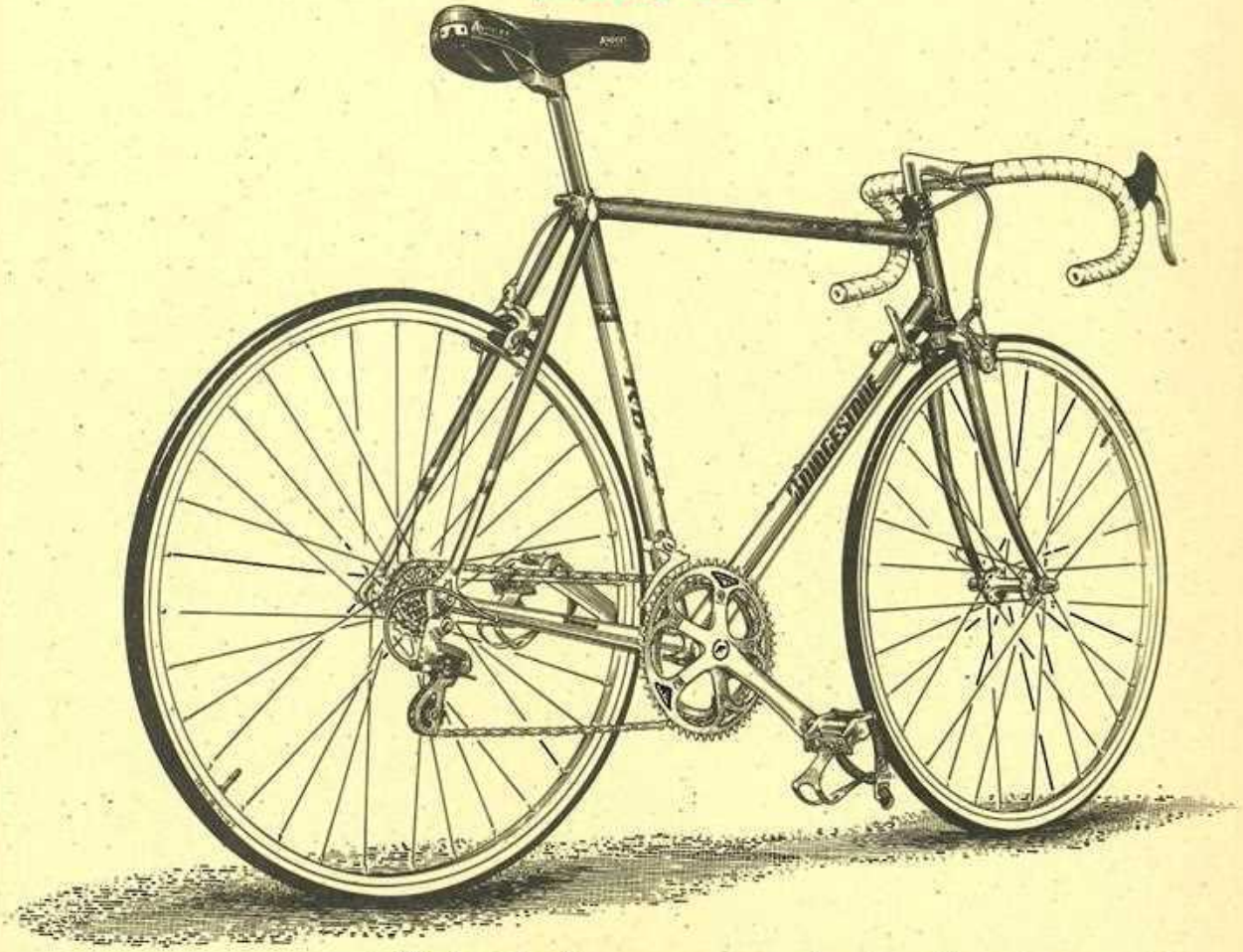
Any of the popular clipless pedals would have added $80 to $160 to the price of this bike, and for that price we thought it best to let you do your own picking. The stock MKS Sylvan pedals have a proven design, weigh just 260 gr. per pair, and will last the average rider 12,000 miles, no problem. The excellent chromed steel Christophe toe clips are a classsic touch from a bygone era.

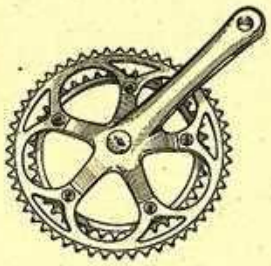
WHAT YOU NEED TO KNOW ABOUT ISHIWATA TUBING

The tubing for the RB-1—Ishiwata 019E, 022E, and 024E, depending on frame size and application (on some sizes we mixed tube sets)—is Ishiwata's best-quality seamless tubing, and the equal of any chrome-moly in the world. It was developed in 1982, and its conventional shape and diameters have remained unchanged through years of marketing hype, triathlon influence, and the oversize craze. It's the same tubing we used on last year's RB-1, but with a new decal. (Bicycle trivia fans note: Freddy Maertens won the 1976 World Championship on a frame made from Ishiwata tubing. The tubing we use on the RB-1 is an improvement over that.)

LOW BUDGET, HIGH SPEED

RB-2





SUGINO AC CRANK HAS A LOWER Q-FACTOR THAN OTHER MIDPRICED CRANKS.

The RB-2 has the same geometry and road qualities as the RB-1, with only a slightly heavier frame and less expensive parts. It's a beautiful bike, a pleasure to ride, and just the ticket for low-budget racing, medium-budget training, and athletic road rides. Like the RB-1, it accepts fat, 28mm wide clinchers (typically labeled "700 x 32C").

The RB-2 is the only bike in its price range with a lugged, Japanese-built frame.

☞ USES: Athletic road riding; some fire trails (with fatter tires); low-budget racing

☞ COLORS: Purple metallic or blue and tusk

☞ TECHNICAL DATA

SIZES: 50, 53, 56, 59, 62CM

FRAME WEIGHT: 4.4 LBS. (56CM)

FORK WEIGHT: 1.5 LBS. (56CM)

BIKE WEIGHT: 23.6 LBS. (56CM)

☞ COMPARED WITH THE RB-1

Slightly heavier gauge tubing, seamed (like True Temper)

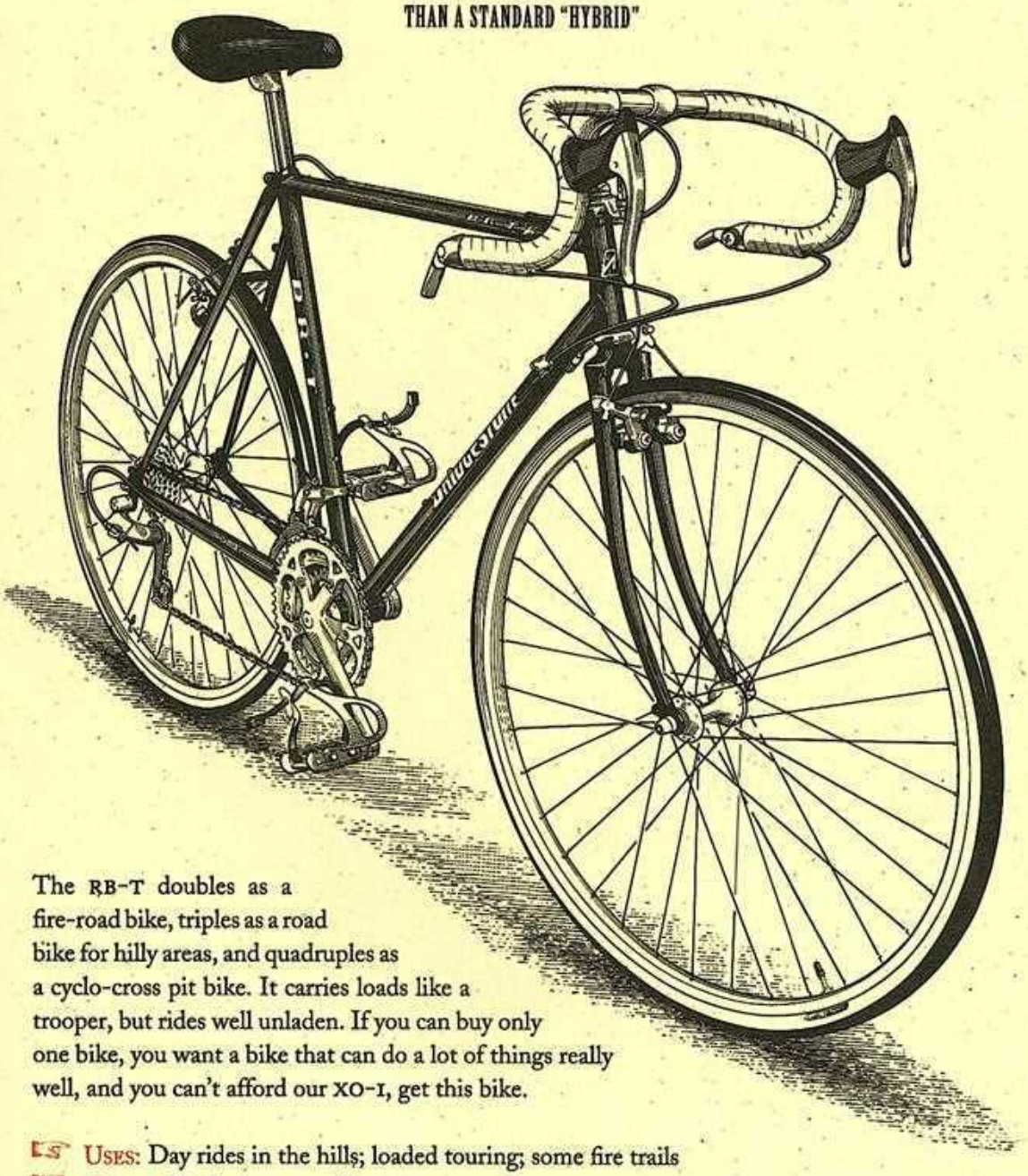
Less-expensive parts

Same geometry and ride, but no 54.5 or 57.5cm sizes

BETTER AT EVERYTHING

RB-T

THAN A STANDARD "HYBRID"



The RB-T doubles as a fire-road bike, triples as a road bike for hilly areas, and quadruples as a cyclo-cross pit bike. It carries loads like a trooper, but rides well unladen. If you can buy only one bike, you want a bike that can do a lot of things really well, and you can't afford our XO-1, get this bike.

- USES: Day rides in the hills; loaded touring; some fire trails
- COLOR: Dark green metallic

TECHNICAL DATA

SIZES: 50, 53, 56, 59, 62CM
FRAME WEIGHT: 4.6 LBS. (56CM)
FORK WEIGHT: 1.75 LBS. (56CM)
BIKE WEIGHT: 25.4 LBS. (56CM)

DIFFERENCES FROM XO-2 AND RB-2

Lower gears and more gears than the RB-2—better for hills, carrying loads, and off-road use. It's faster on the road than an XO-2, but perhaps not as good off-road. The RB-T responds more quickly than most full-touring bikes, but still carries loads exceptionally well.

How To Get Sponsored Even If You Aren't Famous

1

TRY TO GET ON A DEALER'S TEAM.

Dealers often ask manufacturers to sponsor their teams, and these requests have an edge over requests from individuals.

2

SEND A WRITTEN REQUEST FOR THE COMING SEASON NO LATER THAN SEPTEMBER 1.

Most companies dole out sponsorships at the trade shows in late September and October. This is your competition.

3

ADDRESS IT TO THE PERSON RESPONSIBLE FOR SPONSORSHIPS, AND SPELL HIS OR HER NAME CORRECTLY.

"To Whom It May Concern" and the popular "To: Sponsorship Director" make the same impression as "Dear Occupant."

4

MAKE YOUR PROPOSAL LOOK ONE-OF-A-KIND.

Type it on a typewriter, print it on a laser printer, or write it freehand; just avoid dot-matrix letters and photocopies.

5

CALL A BIKE A BIKE—NOT "PRODUCT."

"Product" can refer to bikes, sunglasses, Power Bars, or pig snouts. Referring to (whatever) as "product" gives your proposal that generic, mass-produced touch.

6

DON'T OVERESTIMATE YOUR INFLUENCE.

It probably doesn't extend beyond your immediate peer group, and the sponsor realizes this fact of life.

7

SEPARATE "NEED" FROM "WANT."

Any sporting, athletic, fun, exhilarating use of a bike, sunglasses, or a pig snout eliminates you from the true charities. If you push the "need" aspect, make sure your motives are truly altruistic.

8

BE BRIEF AND SPECIFIC.

"My name is _____ and I'd like an RB-7 and $1,000 for the '92 season" is a good first sentence. Don't make the reader wade though your personal history, top-10 finishes, and 2,500 words to find out what you want. And by all means ask for something specific. "Feel free to contact me to discuss the details" puts the burden of talking turkey on the sponsor. The burden is yours.

9

ABOUT TESTING AND "GIVING FEEDBACK."

Reputable makers employ engineers and quality controllers to find problems early. Your feedback is valuable, but a given, and may not arrive in time to affect new models.

10

YOUR PROPOSAL SHOULD READ WELL OUT LOUD.

Your proposal should sound perfect and natural, as though you were talking directly to that person. Take the time to make it sound articulate, intelligent, sensitive, and natural—the way you'd like to sound in person.

11

REMEMBER, FOR MOST RIDERS, BIKE RIDING OR RACING IS A HOBBY.

Do you request free photographic equipment because your hobby is photography and you promise to espouse it to others? Or free cane rods because you like to flyfish? Manufacturers count on *selling* equipment to hobbyists, not *giving* it to them.

☞ DON'T TAKE THE MONEY AND RUN.

Report often during the season, and don't ask for more freebies. Offer to give customer clinics and demonstrations, or to lead rides. Don't just show up at the door next sponsorship season wearing your mask, snorkel and swim fins.

Affiliations And Beneficiaries

WE'D PLANNED TO SPEND THE SAME ON SPONSORSHIPS IN 1992 AS WE DID IN 1991, BUT WE'VE DECIDED TO BORROW FROM OUR SPONSORSHIP BUDGET TO SUPPORT CYCLING ADVOCACY AND THE ENVIRONMENT. BELOW ARE SOME OF THE GROUPS TO WHOM WE ARE CONTRIBUTING, AND WE HIGHLY RECOMMEND THEM TO YOU.

BIKECENTENNIAL
P.O. BOX 8308, MISSOULA, MT 59807
(406) 721-1776 MEMBERSHIP = $22
America's largest non-profit recreational cycling organization. We're "Recycling America's Backroads." (not *literally*)

CALIFORNIA TROUT, INC.
870 MARKET STREET, SUITE 859
SAN FRANCISCO, CA 94102
(415) 392-8887 MEMBERSHIP = $25
Non-profit conservation organization dedicated to protecting and restoring wild trout, native steelhead, and their waters in California.

CAMPAIGN FOR NEW TRANSPORTATION PRIORITIES
900 SECOND STREET N.E., SUITE 308
WASHINGTON, D.C. 20002
(202) 408-8362
CNTP is a coalition of 37 environmental, consumer and labor organizations nationwide working to change Federal transportation policy to give greater funding priority to mass transit, bicycling, walking, intercity passenger rail and other alternatives to driving alone.

FOSSIL FUELS ACTION/ALLIANCE FOR A PAVING MORATORIUM
P.O. BOX 8558
FREDERICKSBURG, VA 22404
(703) 371-0222 MEMBERSHIP = $30
Since November 1990, created to promote and put an end to the construction of new, paved roads, and parking lots. It works with environmental groups and individuals to communicate and lessen the problems caused by paving.

GREENPEACE USA
1436 U STREET, N.W., WASHINGTON, D.C. 20009
(202) 462-1177 MEMBERSHIP = $30
Dedicated to the preservation of our environment and making the public aware of environmental problems.

INSTITUTE FOR TRANSPORTATION AND DEVELOPMENT POLICY (ITDP)
1787 COLUMBIA ROAD, NW
WASHINGTON, D.C. 20009
(202) 387-1434 MEMBERSHIP = $30
A non-profit organization which promotes sustainable, non-motorized transportation systems (bicycles, cats, etc.) that meet basic human needs and empower the poor. Also known as *Bikes Not Bombs*. Highly recommended!

LEAGUE OF AMERICAN WHEELMEN
190 WEST OSTEND STREET, SUITE 120
BALTIMORE, MD 21230
(301) 539-3399 MEMBERSHIP = $22
Founded in 1880, the LAW is the national organization of bicyclists. It publishes *Bicycle USA*, an almanac of national bicycling activities and touring information. It represents bicycling interests, lobbies on behalf of cycling, and carries out numerous educational activities.

THE NATURE CONSERVANCY
1815 NORTH LYNN STREET
ARLINGTON, VA 22209
(703) 841-5300 MEMBERSHIP = $25
Since 1951 The Nature Conservancy has worked to preserve plants, animals, and natural communities by protecting the lands and waters where they live. It manages more than 1,600 preserves throughout the U.S., the largest private system of nature sanctuaries in the world.

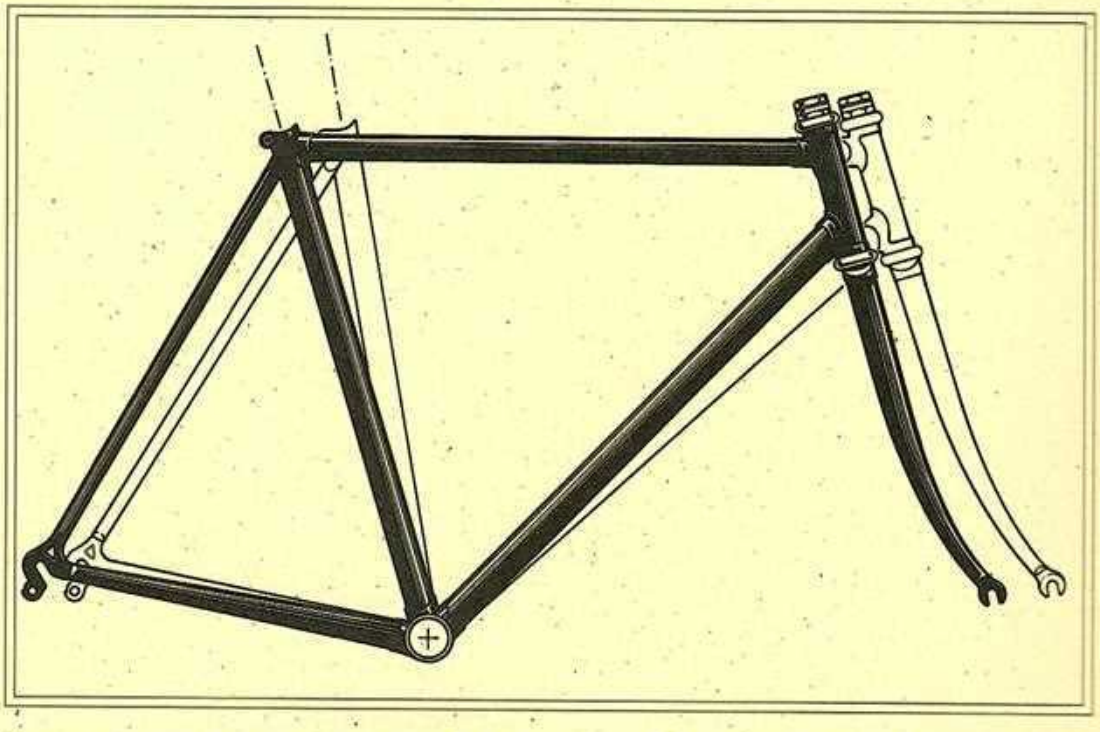
RAILS-TO-TRAILS CONSERVANCY
1400 SIXTEENTH STREET, N.W. SUITE 300
WASHINGTON, D.C. 20036
(202) 797-5400 MEMBERSHIP = $18
The Rails-to-Trails Conservancy is a non-profit organization devoted to converting abandoned railroad rights-of-way into trails for public use. In partnership with citizen groups, public agencies, railroads and others, the Conservancy is working to build a coast-to-coast network of trails for all future generations of Americans to enjoy.

THE AIDS FOUNDATION
BOX 426182
SAN FRANCISCO, CA 94142
(415) 864-5855
Not strictly a cycling or environmental cause, The Aids Foundation specializes in AIDS research, education, and support.

WORLDWATCH INSTITUTE
1776 MASSACHUSETTS AVENUE, N.W.
WASHINGTON, D.C. 20036-1904
(202) 452-1999
Non-profit organization founded in 1975 to inform policymakers and the public about the interdependence of the world economy and the environment. Excellent research papers on various topics. Six issues of *WorldWatch* magazine, $15.

Far-Forward Frames: Fad or Faster?

BY LENNARD ZINN



A FEW YEARS AGO triathletes discovered they could ride faster if they moved their saddles much farther forward. They won races in this position, others copied, and soon bicycle frame builders started building forward-position frames designed specifically for this far-forward position. What appeared to some to be just another triathlon fad was "legitimized" a couple of years ago when American pro road racer and '84 Olympic gold medalist Alexi Grewal started winning road races in this forward position. Alexi had problems with lower back and hip pain to the point that he considered retirement, though, and the far-forward position relieved his pain.

The motive for moving the saddle forward is sound. Aerodynamic drag increases geometrically with speed, and at race speeds of 30 mph or so, aerodynamic drag is by far the largest speed-robbing force. To be aerodynamic, and therefore competitive, you must keep your upper body low and flat. If you happen to have a stiff pelvis, or tight hips or hamstrings, your lower back will arch when you try to get low and aerodynamic on a standard bike. A far-forward position opens up the angle between the thighs and the torso, thereby flattening your back even if you're stiff.

Often triathletes are less able to tip their pelvises forward because they are new to cycling, and it takes time to become flexible. The top European pros in the Tour de France, though, stay low and flat, even though their saddles are far back. It took them a long time to develop that position, and they have fundamental technical reasons for staying back, well behind the cranks.

Going far-forward on a standard bike (by reversing your seat post, moving the saddle forward and using any of the triathlon-style bars) changes your weight distribution. Weight distribution is key to good handling, though, and throwing it off makes the bike harder to

control around high-speed turns, in traffic, or in a pack of riders.

Riding far-forward on a frame designed for this position is better. Bicycles tend to handle best with about 55 percent of your weight on the rear wheel; and you can achieve this on a frame designed with an extra long top tube, extra short chainstays, and a few other extras—but there's a cost. With more weight on your arms, steering is sluggish, becoming even moreso when pedaling, since your arms are bracing you from pushing forward off the nose of the saddle on the downstroke (which is now down and back). This may be acceptable on a closed-course time trial or triathlon, but for general riding it's not.

THE CLASSIC, SUPPLE PEDALING STYLE DISTRIBUTES POWER MORE EVENLY OVER THE ENTIRE PEDAL CIRCLE, WHICH IS WHY IT'S BEST FOR MOST RIDERS.

When using the smallest or largest rear cogs, the short chainstays of a far-forward frame cause the chain to leave the front chainrings at a very sharp angle. This makes for noisy, imprecise shifting and will accelerate wear on chains, cogs, and derailleurs.

Also, current front derailleurs are designed for 72- to 75-degree seat tube angles, and the 78-degree—and steeper—seat tube angles on these bikes move them as much as an inch ahead of ideal, resulting in slower shifting. What's more, the bottom of the trailing edge of the cage is rotated forward on the crank circle, and when the chain is on the inner chainring and any of the two or three smallest rear cogs, it will drag on the bottom of the front derailleur cage—reducing the number of available gears.

The extra short chainstays create their own problems. Since the rear tire is so close to the bottom bracket, it interferes with the front derailleur cable. To avoid this, the cable must be routed in a circuitous (and higher friction) course.

Poor chainstay clearance caused by the short chainstays limits you to a small-volume racing tire. A small tire is a fast tire, but that's its only merit. Small tires are not suitable for rough-road riding, longer rides, or carrying loads. Unless your bike is strictly a race bike, at some point you're sure to want the versatility you get with a larger tire.

Far-forward pedaling emphasizes a strong downstroke powered entirely by the quadriceps. While triathletes may favor this sort of style due to its similarity to running, it has its weak points for both road racers and nontriathletes alike. To do the same amount of work in one crank revolution as a classic pedaler, the far-forward rider must generate a much higher peak pedaling force, compensating for the reduced force at other points in the stroke. Lactic acid buildup in muscles is greater at peak forces, so unless you're accustomed to far-forward pedaling, you may get tired faster. (A triathlete with an up and down pedal stroke may be equally inefficient farther back—and perhaps less aerodynamic—so the forward position may be his or her best choice.)

The classic, supple pedaling style distributes power more evenly over the entire pedal circle, which is why it's best for most riders.

If you compete, particularly in triathlons, and for physiological reasons are unable to pedal as aerodynamically in a smoother, more powerful position farther back, then a far-forward position may be just the ticket. And it might be right for you if a majority of your rides are solo time trials on flat-to-rolling terrain. But for most riding, from racing to commuting to athletic weekend group rides on a variety of courses and terrain, you'll do best with a traditional frame and classic pedaling form.

Lennard Zinn is a custom framebuilder from Boulder, Colorado. He has a degree in physics, is a former member of the U.S. National Cycling Team, and has been building frames for over ten years.

The Benefits of a Little Frame Flex

AND OBSERVATIONS ON OVERSIZED TUBING

A BIKE FRAME IS A SPRING, so it's *supposed* to flex. Just as a spring can be too springy, a bike frame can flex too much, which is why the Myth of Stiffness originated. Since too much frame flex is obviously bad (the bike shifts by itself when you climb steep hills and feels soft, whippy, and hard to control on severe descents), it's easy to sell people on the notion that all flex is bad.

But a *little* flex does a lot of good. It increases frame life by distributing stress that would otherwise concentrate at the joints; it adds comfort; and it makes a bike feel alive, like a muscle.

INNER: 31.8MM—ORIGINAL OVERSIZED DOWN TUBE.
OUTER: 34.9MM—TOO FAT FOR US.

The Stiffness Sellers say the energy that goes into flexing the frame is energy diverted from the job of propelling you forward—an idea that seems to make sense, and one that certainly convinces a lot of people. After all, it's hard to jump high from a bed of soft, cushy foam.

But you can jump higher from a sprung wooden floor than from a rigid cement floor, because the little amount of spring aids your effort. A bike frame flexes under the pressure of pedaling, and, as it recovers from the flex, releases some of that energy to help you go.

Obsession with stiffness is an American phenomenon. In Europe the toughest races, fastest sprints, and most demanding cyclo-cross battles are won on frames that, by the rigid standards prevalent here, would be considered downright whippy. The most efficient frame for you is one that flexes the right amount for your weight, pedaling style, and the terrain you ride.

Part of what makes our bikes ride as well as they do is the controlled amount of flex we design into the frames.

OVERSIZED FRAME TUBING: THEN AND NOW

Oversized frame tubing makes a frame stiffer and stronger, but at some point the drawbacks outweigh the benefits.

When the first mountain bikes were made in 1979, the designers recognized that frames for off-road riding ought to be more robust than frames for road riding, so they increased the top tube from 1" to 1⅛" and the down tube from 1⅛" to 1¼". This original oversizing, about 12 percent, translates to an even higher increase in strength and rigidity. It remained unchanged for several years because it worked well.

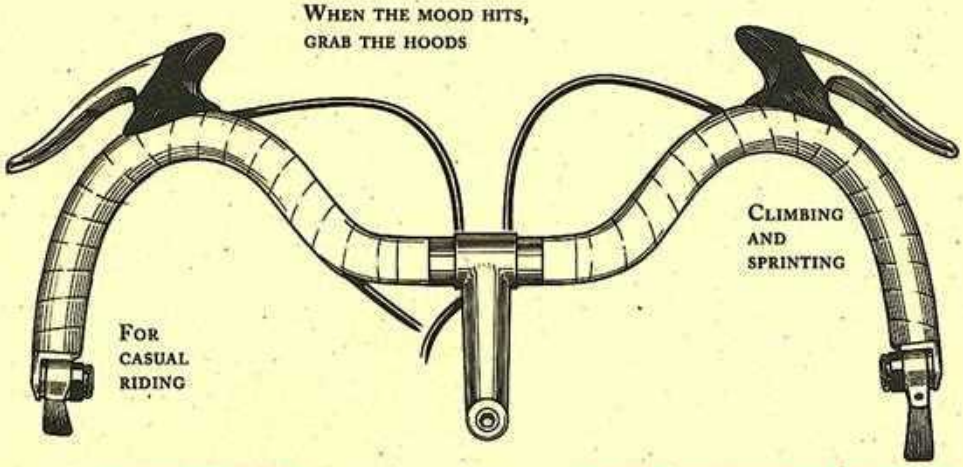
Really fat tubing makes sense in aluminum; in fact, it's an engineering requirement. Since aluminum generally isn't as strong as steel and has just one-third of steel's inherent rigidity, it needs to be larger in diameter to compensate. What's more, aluminum frame tubes require relatively large-radius welds for strength. That's why all welded aluminum bike frames are so fat.

But in steel, once the strength and rigidity requirements are met, as we believe they are with the original oversizing, further increases in diameter add unnecessary weight.

For mountain bikes, we prefer the original oversized tubes, but it's not wise to choose any bike solely on the size of its frame tubes. Look at the entire bike as a package, and buy the package that makes the most sense to you.

Meanwhile, terrain, riding styles, and body proportions haven't changed much since 1979, and for most riders the original 12 percent oversized mountain bike tubes continue to make as much sense and perform as well as ever.

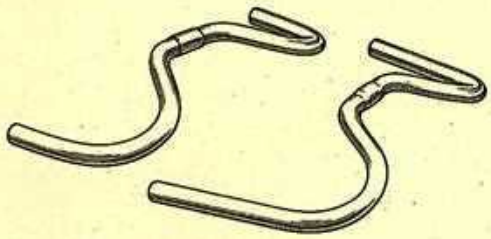
Moustache Handlebars



HISTORY AND DESIGN

MANY SCHOOL DISTRICTS in Japan forbid students to commute with drop bars, because they think drops encourage fast, crazy riding. So to appeal to the kids who like drops, "semi-drop" bars were developed. We rode "semi-drops" a few hundred miles and found them to be a blessed alternative to the single-hand placement constraints of regular flat bars. But we improved them.

Using "semi-drops" as our base, we designed Moustache Handlebars with a larger forward radius to better fit our adult-sized palms. We rode 2,800 km on road and dirt with four prototypes before settling on the final moustache shape. It's just what we wanted.



LEFT: TYPE 1 FITS ROAD LEVERS AND BAR-CONS.
RIGHT: TYPE 2 FITS MTN LEVERS, SHIFTERS, GRIPS.

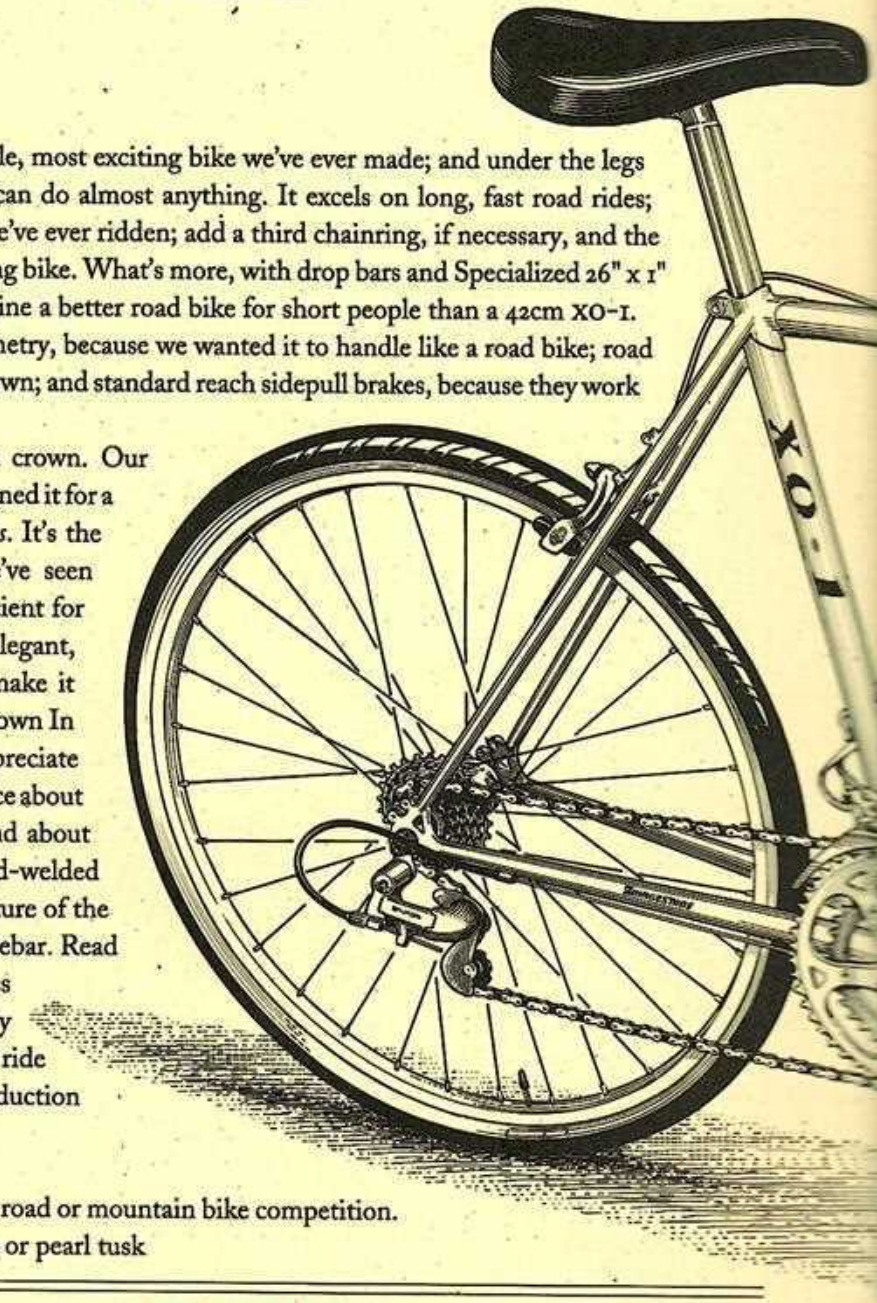
HOW GOOD ARE MOUSTACHE HANDLEBARS?

NOT PERFECT. Any drop-bar fan will miss the next-to-the-stem hand position. The advantage over drops is quicker access to the ends of the brake levers, making Moustache Handlebars equally good for quick braking and powerful braking, just like mountain bike brake levers. The advantage over flat bars is having more hand positions. You can ride Moustache Handlebars for hours without groping, and you'll appreciate them even on a quick trip to the store. And the Moustache Handlebars look good, too. The retro-attractive curves go well with any bicycle. Moreso, we think, than the angular, afterthought look of bolt-ons.

Moustache Handlebar Weights and Measures: 2 versions.

	Bar diameter (mm)	Ferrule diameter (mm)	Compatible with bar-end shifters?	Compatible with mountain shifters?	Width (mm)	Weight (g)
Type 1 (as on XO-1)	23.8	26.0	yes	no	51.0	295
Type 2 (as on XO-2)	22.2	25.4	not quite	yes	52.5	320

THIS XO-1 IS A TERRIFIC BIKE



The XO-1 is the most versatile, most exciting bike we've ever made; and under the legs of a strong, skilled rider, it can do almost anything. It excels on long, fast road rides; it's the best commute bike we've ever ridden; add a third chainring, if necessary, and the XO-1 becomes a dandy touring bike. What's more, with drop bars and Specialized 26" x 1" Turbo™ tires, we can't imagine a better road bike for short people than a 42cm XO-1.

The XO-1 has road geometry, because we wanted it to handle like a road bike; road tubing, to keep the weight down; and standard reach sidepull brakes, because they work well and look good.

Please look at the fork crown. Our Japanese staff originally designed it for a touring model called *Atlantis*. It's the only quality fork crown we've seen with internal clearance sufficient for tires up to 1.6"; and it has an elegant, intricate design that helps make it the Most Expensive Fork Crown In the World. We hope you appreciate it, because it increased the price about $30 over a unicrown fork, and about $25 over that of a pressed-and-welded crown. The most glaring feature of the XO-1 is the Moustache Handlebar. Read about it on page 35. Regardless of what other bikes you already own, the XO-1 is the bike you'll ride most of the time. Limited production of 1,000.

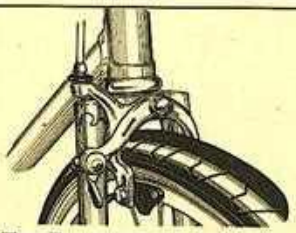
☞ USES: Everything except road or mountain bike competition.
☞ COLORS: Purple metallic or pearl tusk

☞ TECHNICAL DATA

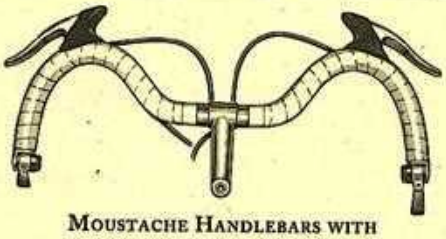
SIZES: 42, 48, 52, 55, 59CM
FRAME WEIGHT: 4.2 LBS. (52CM)
FORK WEIGHT: 1.5 LBS. (52CM)
BIKE WEIGHT: 24 LBS.

☞ UPGRADES FROM XO-2

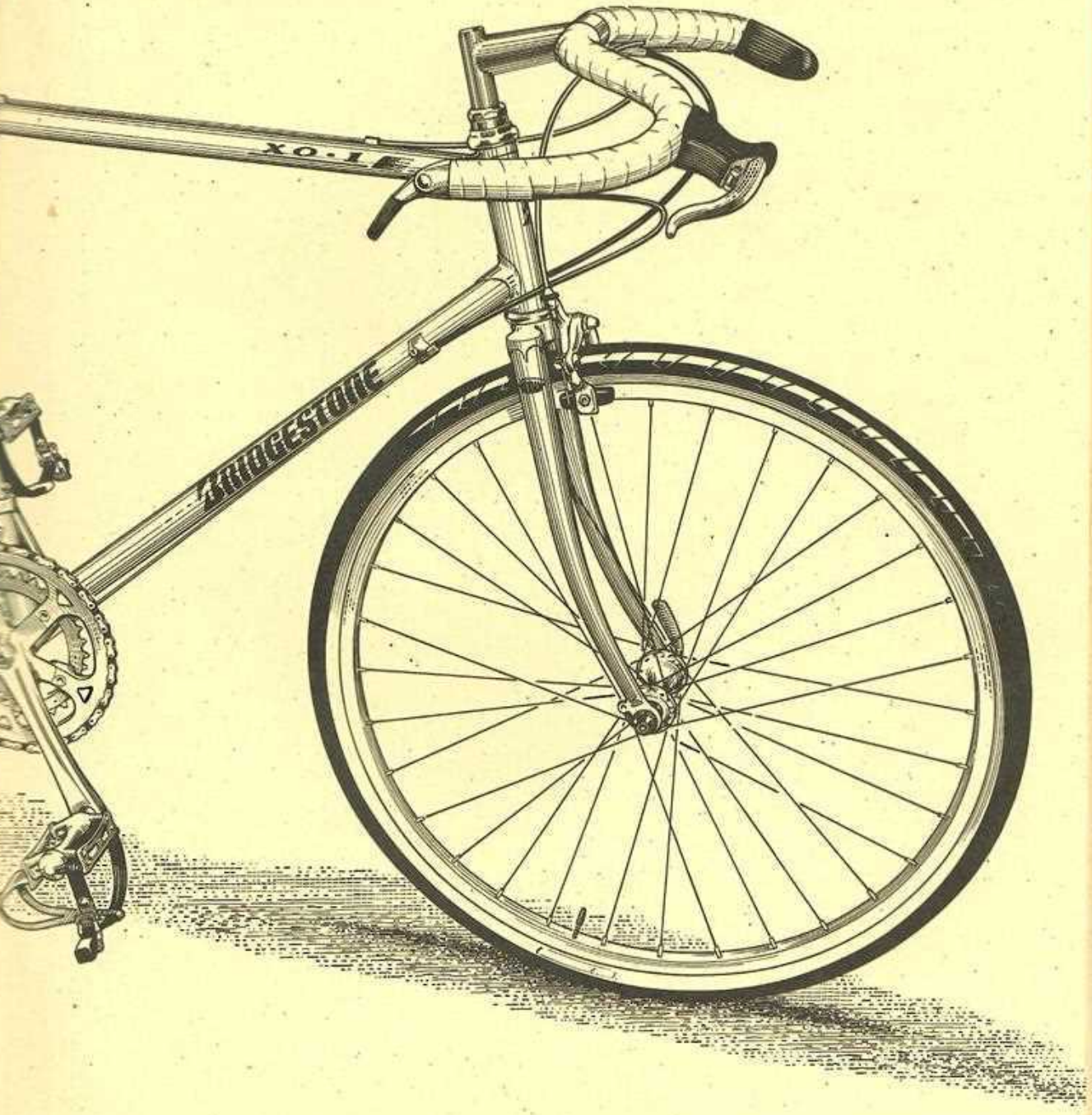
Lighter frame, seamless tubing
Lighter fork, with World's Most Expensive Fork Crown
Lighter wheels, crank, and leather saddle
Nitto-built Moustache Handlebars
Made in Japan



THE BRIDGESTONE-DESIGNED FORK CROWN LOOKS GREAT AND ACCEPTS TIRES UP TO 1.6".



MOUSTACHE HANDLEBARS WITH BAR-END SHIFTERS ARE HANDY AND COMFORTABLE.



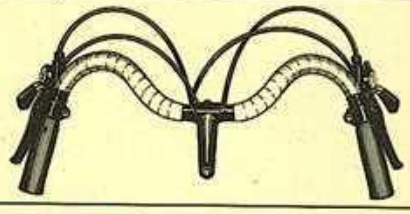
"XO" IS NOT "CROSS-OVER" IT'S "HUGS AND KISSES"

XO-2

Compare the 1992 XO-2 with a typical "hybrid": The XO-2 has multiposition Moustache Handlebars for more comfort, speed, and power; 26" x 1.4" Tom Slick road tires for more secure cornering, longer wear, and reduced rolling resistance; and 26" Ritchey rims for more strength and less weight. It's quite versatile.

☞ USES: Commuting, touring, fire trails—any distance, flat or hilly.
☞ COLORS: Dark green metallic or pearl white

MOUSTACHE HANDLEBARS LET YOU PUT YOUR HANDS ANYWHERE YOU LIKE. GRAB THE GRIPS TO SIT UPRIGHT, OR REST YOUR HANDS IN THE CURVES TO GO FAST.



☞ TECHNICAL DATA

SIZES: 42, 48, 52, 55, 59CM
FRAME WEIGHT: 4.8 LBS. (52CM)
FORK WEIGHT: 1.75 LBS. (52CM)
BIKE WEIGHT: 27.1 LBS. (52CM)

☞ UPGRADES FROM XO-3

Full CrMo frame
Alloy, Moustache Handlebars and Deore DX top-mount shifters
Shimano 500CX crank with aluminum alloy chainrings
Shimano 400LX derailleurs

A REAL PAVEMENT PIRANHA

XO-3

BETTER THAN YOUR AVERAGE "HYBRID"

ARC BARS: A BEAUTIFUL SHAPE THAT ADDS COMFORT AND IMPROVES CLIMBING.

TECHNICAL DATA

SIZES: 43, 46L, 48, 52, 57CM

FRAME WEIGHT: 5.5 LBS. (52CM)

FORK WEIGHT: 1.75 LBS. (52CM)

BIKE WEIGHT: 28.7 LBS. (52CM)

COMPARED WITH A TYPICAL "HYBRID," THE XO-3 HAS

More traction, thanks to tires with road tread.

A lower standover height, for more crotch clearance.

A shorter top tube, for a more upright position.

Less weight.

The best-designed, best-fitting 700c-wheeled bike of its type, and strong competition for anyone's $400 "hybrid." The XO-3 has a lower standover height than most hybrids with 700c wheels, so it fits short-legged people better. It has a shorter top tube, for a more upright riding position. The XO-3's road-tread tires grip better than any knobbies. The ARC handlebars are the XO-3's single neatest feature. We've retrofitted several of our personal bikes with them. They're really nice.

USES: Casual-to-athletic rides of up to 25 miles, flat-to-hilly terrain, pavement to moderate fire trails. Our answer to everybody else's 700c-wheeled "hybrid."

COLORS: Red or blue

IT LOOKS LIKE A MOUNTAIN BIKE

BB-1

BUT DON'T BE FOOLED

TOP-MOUNT SHIFTERS ARE LIGHTER, FASTER, EASIER, AND MORE RELIABLE THAN UNDERBAR SHIFTERS.

"BB" stands for "Basic BRIDGESTONE" or "Best Buy," whichever you prefer. The BB-1 is our least expensive new model. (We have a few '91 CB-1's left, and they can be had for a bit less.) Its strong points are its lightweight frame, chrome-moly fork, round chainrings, and top-mount shifters with friction option. The frames on the BB-1 and CB-1 are identical, with our own size-specific geometry for a better fit and ride.

☞ USES: Casual rides of up to 15 miles, flat-to-rolling terrain, pavement to moderate fire trails. Versatile and fun to ride.

☞ COLORS: Red or black

☞ TECHNICAL DATA

SIZES: 42, 43L, 46, 49L, 50, 56CM

FRAME WEIGHT: 5.7 LBS. (50CM)

FORK WEIGHT: 1.75 LBS. (50CM)

FRAME WEIGHT: 29.8 LBS. (50CM)

☞ UPGRADES FROM CB-1

Quick-release rear wheel

Round chainrings

Stainless-steel spokes

CAN YOU SAY

CB-1

"ENCORE"?

We have about 4,500 of last year's CB-1's left over, and since it escaped the significant parts price increases of this year, this bike is a bargain. It has the same frame and quality of parts as the BB-1 but with a nutted rear hub, stain-resistant spokes, Biopace chainrings, and medium-rise handlebar.

☞ USES: Casual rides of up to 15 miles, flat to rolling terrain, pavement to moderate fire trails. Like our BB-1, it's versatile and fun to ride. The upright handlebars allow a more upright, relaxed position.
☞ COLORS: Red or black

☞ TECHNICAL DATA

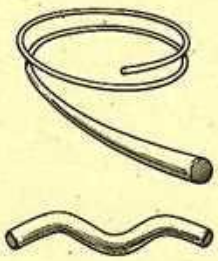
SIZES: 42, 43L, 46, 49L, 50, 56CM
FRAME WEIGHT: 5.7 LBS. (50CM)
FORK WEIGHT: 1.75 LBS. (50CM)
BIKE WEIGHT: 29.8 LBS. (50CM)

☞ DIFFERENCES FROM BB-1

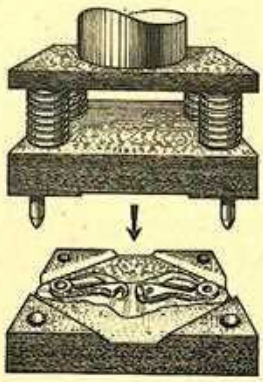
More upright handlebar
Biopace chainrings
Theft-resistant rear wheel

BELOW WE DESCRIBE FOUR COMMON PROCESSES USED FOR MANUFACTURING ALUMINUM ALLOY BICYCLE PARTS. THERE ARE TRADE SECRETS INVOLVING MINUTE DIFFERENCES IN HEAT, TIME, AND ALLOY, BUT THE BASIC PROCESSES ARE THE SAME REGARDLESS OF WHO'S DOING THE WORK.

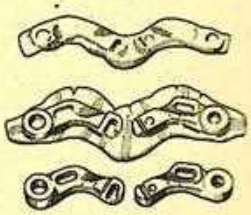
Cold-Forging



DIA-COMPE #986 CANTILEVERS BEGIN AS BAR STOCK 6061-T6 ALUMINUM. FIRST, THEY'RE CUT, BENT, AND PREPPED FOR FORGING...



...THEN SMASHED TWICE. IN THIS CASE, THE SECOND AND FINAL SMASHING COMPLETES THE SHAPE.



TOP: AFTER THE FIRST STOMPING. MIDDLE: AFTER THE SECOND STOMPING, SHOWING EXCESS. BOTTOM: EXCESS REMOVED, READY FOR FINISHING.

IN COLD-FORGING, the alloy is warmed to a temperature just below the point at which the crystalline structure is changed, then bashed into shape by means of forging dies (like molds). Brakes can be formed in one or two bashings of up to 330 tons each, but more complex and massive parts—crank arms—require up to six whomps of up to 660 tons to reach final form.

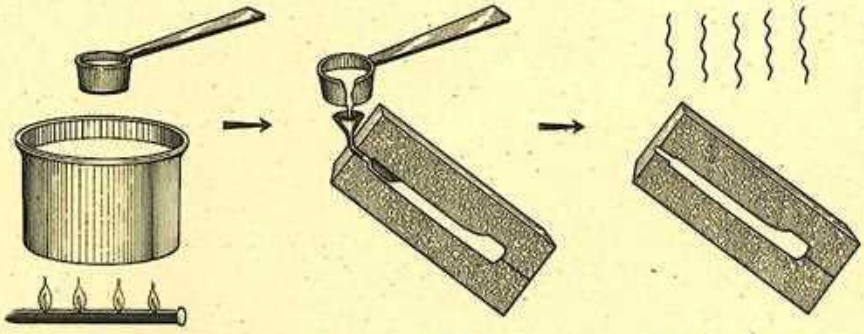
Cold-forging alloys are high-strength to begin with (cold-forged cranks are often made from 7075-T6; 74,000 psi), and the forging process adds grain structure along the curves of the piece, much like the grain in a crooked tree branch. Cold-forged parts are typically thinner, lighter, stronger, more accurately made, and more expensive than cast parts.

Hot-Forging

IN HOT-FORGING, a slightly lower-strength alloy (for cranks, around 65,000 psi) is heated, softened, then stomped into shape with one fell blow. Hot-forged cranks cost less to make than cold-forged cranks mainly because the tooling lasts longer and fewer dies are needed.

NOTE: IN THE DESCRIPTIONS, "WHOMP," "STOMP," "BASH," "SMASH," AND "FORGE" ARE USED INTERCHANGEABLY.

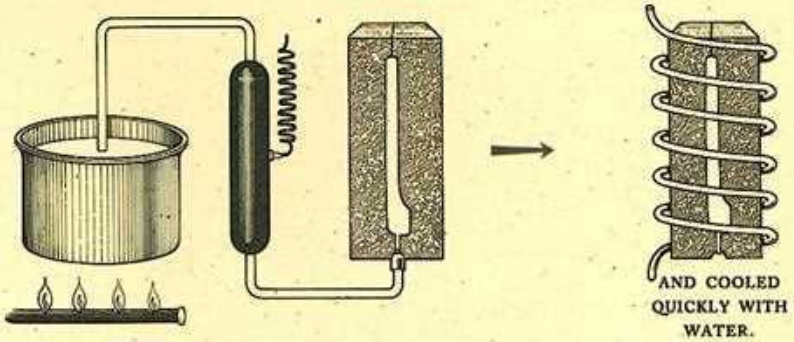
Gravity-Casting



THE ALUMINUM IS MELTED... THEN POURED INTO A MOLD... AND ALLOWED TO COOL NATURALLY.

IN GRAVITY-CASTING, still another alloy (typically ACIB-T4; 42,000 psi tensile strength) is melted, then poured into a mold and allowed to cool naturally. During the cooling, air bubbles gravitate upwards and out—hence the term. The alloy isn't as strong as that used for hot- or cold- forging, but it is about 30 percent stronger than the alloy used in melt-forging. Compared with melt-forged parts, gravity-cast parts tend to be more expensive, stronger, lighter, and less brittle (not that brittleness or strength are problems with well-made melt-forgings). Gravity-castings, like hot- and cold-forgings, can be anodized, and consequently the finished pieces can be difficult to distinguish from hot- or cold-forgings. Some cranks, such as the excellent Specialized ST-4, are gravity-cast and then, for added strength, whomped once in a forging die.

Melt-Forging



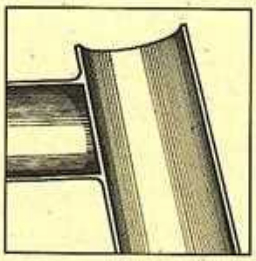
THE ALUMINUM IS MELTED AND THEN FORCED INTO A MOLD UNDER HIGH PRESSURE... AND COOLED QUICKLY WITH WATER.

MELT-FORGING is high-pressure casting, in which molten AC4C-T6 aluminum (tensile strength approx. 32,714 psi) is forced into a mold under roughly 11,378.4 lbs. of pressure. This eliminates bubbles much faster and more economically than in gravity-casting. The "forged" piece is then cooled quickly with water. To compensate for the lower strength of AC4C-T6 (only 50 percent of typical crank cold-forging alloys and 75 percent of crank gravity-casting alloys), the parts tend to be chunkier. Since AC4C-T6 cannot be anodized, melt-forged parts never display the fine finishes possible with hot-forgings, cold-forgings, or gravity-castings. Still, melt-forging has made relatively lightweight, attractive, reliable components affordable to people who would otherwise ride steel.

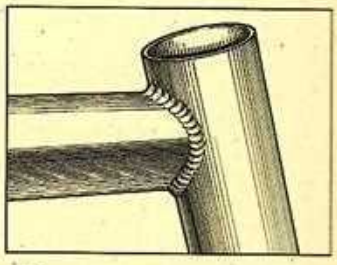
A Tube-Joining Primer

TIG-WELDING

TIG-WELDING BECAME ACCEPTED through mountain bikes, because the road-tubing lugs available in the early '80's wouldn't work for mountain bike frame geometries and larger tube diameters. TIG-welding is a lugless process, and has proven itself worthy.



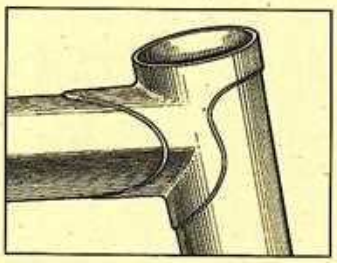
INSIDE: NOT MUCH BEEF, BUT IT'S STRONG.



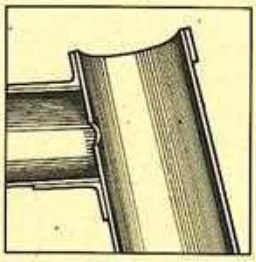
TINY OVERLAPPING PANCAKES LOOK CLEAN AND TIDY.

TIG-welding's strong points are its light weight (no lugs or brass), strength, and ease of fabrication. There's little room to cheat with a TIG-welded joint; the miter has to be perfect and the quality of the joint is clearly visible.

TIG-welded BRIDGESTONE models include: MB-3, 4, 5, 6; XO-2, 3; BB-1, and CB-1.



THE LUG SERVES AS EXTERNAL REINFORCEMENT, AND IT LOOKS NICE TOO.



CAPILLARY ACTION DRAWS MOLTEN BRASS INTO THE TUBE/LUG GAP.

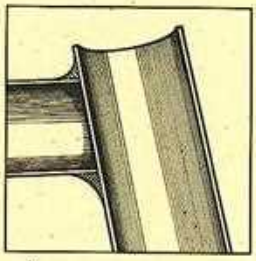
LUGGED JOINTS

IN A TRADITIONAL lugged joint, the lug serves as external butting, increasing the strength at the joint. The integrity of the joint depends on the accuracy of the tube miter, which is hidden by the lugs; the dimensions of the lug; the fit between the tube and the lug; and of course the skill of the builder. It's often mentioned, particularly with regard to mountain bike frames, that lugs are confining; that a builder has to build to fit the available lugs. That's not an issue with us; if lugs we want aren't available, we have them made.

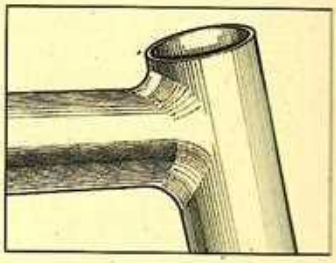
Lugged Bridgestones include: MB-1, MB-2; XO-1; RB-1, RB-2, and RB-T.

FILLET-BRAZING

IN FILLET-BRAZING (*pron. "fil-let," not "fil-lay"*) the joint is created by flowing molten brass around the tubing junctures. Usually the hardened brass is slightly irregular, and most builders then file or sand it to create a smooth, appealing joint that when painted gives the bike an intriguing, one-piece look. A high-quality fillet might create the strongest of all frame joints, but there's no way to tell the quality just by looking. Anybody can "puddle" brass, but a skilled builder uses a minimum of heat and time to do it; others torch away, then cover their mistakes with putty and paint.



MOLTEN BRASS FLOWS INTO AND AROUND THE JOINT.



THE LARGE RADIUS DISTRIBUTES STRESS AND GIVES THE JOINT A ONE-PIECE LOOK.

Eighteen Questions

PLEASE FILL OUT THIS QUESTIONNAIRE (OR A PHOTOCOPY THEREOF) AND MAIL IT BACK TO US. WE'LL PUT THE COMPLETED QUESTIONNAIRES INTO A TUB AND DRAW 20 NAMES BIMONTHLY, FROM JANUARY THROUGH SEPTEMBER, 1992. WINNERS WILL RECEIVE A T-SHIRT, A BICYCLE OF OUR CHOOSING, OR ANY OF SEVERAL OTHER PRIZES.

1

How many hours will you cycle in 1992?

☐ FEWER THAN 50 ☐ 51 - 100
☐ 101 - 250 ☐ MORE THAN 250

2

How many times per week do you commute (at least one way) by bike?

☐ ZERO ☐ 1 ☐ 2 ☐ 3+

3

How many times per week do you shop/run errands by bike?

☐ ZERO ☐ 1 ☐ 2 ☐ 3+

4

Why do you ride? (Check all that apply)

☐ FITNESS/HEALTH ☐ FUEL CONSERVATION
☐ UTILITY ☐ PLEASURE/RECREATION

5

How many bikes do you own?

☐ ZERO ☐ 1 ☐ 2 ☐ 3+

6

List the brand/model of your newest road bike:

_____

7

List the brand/model of your newest mountain bike:

_____

8

When do you think you'll buy your next road bike?

☐ WITHIN 1 YEAR ☐ 2 - 3 YEARS
☐ 4 - 6 YEARS ☐ _____

9

When do you think you'll buy your next mountain bike?

☐ WITHIN 1 YEAR ☐ 2 - 3 YEARS
☐ 4 - 6 YEARS ☐ _____

10

When do you think you'll buy your next "hybrid" or other bike?

☐ WITHIN 1 YEAR ☐ 2 - 3 YEARS
☐ 4 - 6 YEARS ☐ _____

11

How much are you willing to spend on your next bike?

☐ LESS THAN $400 ☐ $400 - $500
☐ $501 - $750 ☐ MORE THAN $750

(CONTINUED ON NEXT PAGE)

12

What brands or models are you considering?

1. _____
2. _____
3. _____

13

How much influence do each of the following have over your decision ?
(3= a lot, 2= a little, 1= none)

___ DEALER ___ FRIENDS
___ MAGAZINE REVIEWS ___ ADVERTISING
___ PRICE ___ COLOR
___ FAME/PRESTIGIOUS RACE WINS
___ TECHNICAL DETAIL/RIDE QUALITY
___ OTHER_____

14

Which cycling magazines do you read?

☐ BICYCLING ☐ NONE
☐ WINNING
☐ MOUNTAIN BIKE ACTION
☐ MOUNTAIN AND CITY BIKING
☐ BICYCLE GUIDE
☐ VELONEWS
☐ OTHER_____

15

Rank in order of importance the qualities you seek in a bicycle dealer:
(3= very important, 2= somewhat important, 1= not important)

___ PRICE ___ CONVENIENCE
___ FRIENDLINESS ___ SELECTION
___ TECHNICAL KNOWLEDGE
___ SERVICE ___ OTHER

16

How far are you willing to travel to your "ideal" dealer?

☐ UP TO 5 MILES ☐ 6 - 10 MILES
☐ 11 - 20 MILES ☐ _____

17

Where did you get this catalogue?

☐ DEALER ☐ MAIL ☐ OTHER_____

18

List your nearest BRIDGESTONE dealer, if known:

_____
NAME CITY STATE

In the event that we draw your name, we will need to contact you.
Please fill out the following information:

_____
NAME

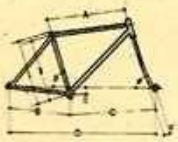
_____
ADDRESS STATE ZIP

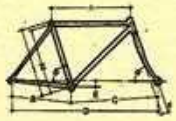
_____
AGE SEX SHIRT SIZE

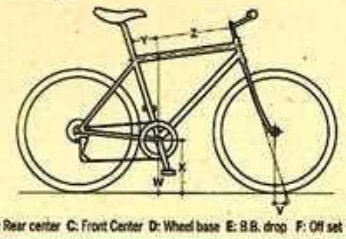
_____
ROAD BIKE SIZE MOUNTAIN BIKE SIZE

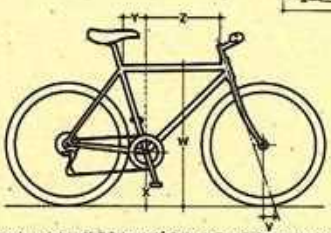
THANK YOU. GOOD LUCK.

Frame Geometry









A: Top tube B: Rear center C: Front Center D: Wheel base E: B.B. drop F: Off set a: Head angle b: Seat angle V:Trail W: Stand-over height X: B.B. height Y: Setback Z: z S: Stem extension CR: Crank length

MB-1

Frame	Seat Tube	A	B	C	D	F	a	b	V	W	Y	Z	S	CR
38cm	380	520	425	596	1018	40	71	74	73	684	98	422	110	170
42cm	420	550	425	615	1036	40	71.5	73.5	70	711	113	437	110	170
46cm	460	565	425	618	1040	40	72	73.5	66	742	126	439	120	172.5
49cm	490	575	425	621	1043	40	72	73.5	66	764	134	441	130	172.5
52cm	520	585	425	625	1046	40	72	73	66	790	147	438	140	175
55cm	550	595	425	635	1057	40	72	73	66	819	156	439	140	175

Q-Factor: 151 Seat Post: 27.2 — Spoke Length F: 267; R:265/267 — BB Drop: 40 — BB Spindle: 120 — BB Height: 297 — Rear Overlocknut: 130

MB-2

Frame	Seat Tube	A	B	C	D	F	a	b	V	W	Y	Z	S	CR
38cm	380	520	425	596	1018	40	71	74	73	684	98	422	110	170
42cm	420	550	425	615	1036	40	71.5	73.5	70	711	113	437	110	170
46cm	460	565	425	618	1040	40	72	73.5	66	742	126	439	120	170
49cm	490	575	425	621	1043	40	72	73.5	66	764	134	441	130	175
52cm	520	585	425	625	1046	40	72	73	66	790	147	438	140	175
55cm	550	595	425	635	1057	40	72	73	66	819	156	439	140	175

Q-Factor: 159 Seat Post: 27.2 — Spoke Length F: 267; R:263/265 — BB Drop: 40 — BB Spindle: 126 — BB Height: 297 — Rear Overlocknut: 130

MB-3

Frame	Seat Tube	A	B	C	D	F	a	b	V	W	Y	Z	S	CR
38cm	380	520	425	598	1020	40	71	74	73	675	93	427	120	170
42cm	420	550	425	619	1041	40	71.5	73.5	70	707	108	442	120	170
46cm	460	565	425	624	1046	40	72	73.5	66	737	122	443	120	175
49cm	490	575	425	628	1050	40	72	73.5	66	759	131	444	130	175
52cm	520	585	425	628	1050	40	72	73	66	782	144	441	130	175
55cm	550	595	425	635	1057	40	72	73	66	808	153	442	140	175

Q-Factor: 164 Seat Post: 26.2 — Spoke Length F: 267; R:263/265 — BB Drop: 40 — BB Spindle: 122.5 — BB Height: 295 — Rear Overlocknut: 130

MB-4

Frame	Seat Tube	A	B	C	D	F	a	b	V	W	Y	Z	S	CR
38cm	380	520	425	598	1020	40	71	74	73	675	93	427	120	170
42cm	420	550	425	619	1041	40	71.5	73.5	70	707	108	442	120	170
46cm	460	565	425	624	1046	40	72	73.5	66	737	122	443	120	175
49cm	490	575	425	628	1050	40	72	73.5	66	759	131	444	130	175
52cm	520	585	425	628	1050	40	72	73	66	782	144	441	130	175
55cm	550	595	425	635	1057	40	72	73	66	808	153	442	140	175

Q-Factor: 159 Seat Post: 26.2 — Spoke Length F: 267; R:263/265 — BB Drop: 40 — BB Spindle: 122.5 — BB Height: 295 — Rear Overlocknut: 130

MB-5

Frame	Seat Tube	A	B	C	D	F	a	b	V	W	Y	Z	S	CR
38cm	380	520	425	598	1020	40	71	74	73	675	93	427	120	170
42cm	420	550	425	619	1041	40	71.5	73.5	70	707	108	442	120	170
46cm	460	565	425	624	1046	40	72	73.5	66	737	122	443	120	175
49cm	490	575	425	628	1050	40	72	73.5	66	759	131	444	130	175
52cm	520	585	425	628	1050	40	72	73	66	782	144	441	130	175
55cm	550	595	425	635	1057	40	72	73	66	808	153	442	130	175
58cm	580	610	425	639	1061	40	72	73	66	837	172	438	135	175

Q-Factor: 164 Seat Post: 26.2 — Spoke Length F: 267; R:263/265 — BB Drop: 40 — BB Spindle: 119 — BB Height: 295 — Rear Overlocknut: 130

MB-6

Frame	Seat Tube	A	B	C	D	F	a	b	V	W	Y	Z	S	CR
38cm	380	520	425	598	1020	40	71	74	73	675	93	427	110	170
42cm	420	550	425	619	1041	40	71.5	73.5	70	707	108	442	110	170
46cm	460	565	425	624	1046	40	72	73.5	66	737	122	443	130	170
49cm	490	575	425	628	1050	40	72	73.5	66	759	131	444	130	175
52cm	520	585	425	628	1050	40	72	73	66	782	144	441	130	175
55cm	550	595	425	635	1057	40	72	73	66	808	153	442	130	175

Q-Factor: 161 Seat Post: 26.2 — Spoke Length F: 263; R:260/262 — BB Drop: 40 — BB Spindle: 121.5 — BB Height: 292 — Rear Overlocknut: 130

MB-P1

Frame	Seat Tube	A	B	C	D	F	a	b	V	W	Y	Z	S	CR
42cm	420	520	435	596	1027	50	71	73	62	694	113	407	80	170
46cm	460	540	435	613	1044	50	71	73	62	727	126	414	80	170
50cm	500	560	435	623	1054	50	71.5	72.5	59	763	141	419	110	170
56cm	560	570	435	620	1051	50	71.5	72.5	59	807	160	410	110	175
43cm L	430	504	435	584	1038	50	71	73	62	580	114	390	80	170
49cm L	490	534	435	607	1014	50	71	73	62	580	134	400	110	170

Q-Factor: 166 Seat Post: 26.2 — Spoke Length F: 264; R:260/262 — BB Drop: 50 — BB Spindle: 119 — BB Height: 279 — Rear Overlocknut: 130

RB-1

Frame	Seat Tube	A	B	C	D	F	a	b	V	W	Y	Z	S	CR
50cm	500	525	410	574	973	50	72.5	74	55	743	133	392	90	170
53cm	530	545	410	580	979	45	73	73.5	57	773	146	399	100	170
54.5cm	545	550	410	585	984	45	73	73.5	57	789	150	400	110	172.5
56cm	560	565	410	590	990	45	73.5	73	54	800	159	406	110	172.5
57.5cm	575	575	410	600	1000	45	73.5	73	54	817	163	412	120	175
59cm	590	585	410	595	995	40	74	72.5	56	828	172	413	120	175
62cm	620	600	410	604	1004	40	74.5	72.5	53	856	181	419	130	175

Q-Factor: 153 Seat Post: 27.0 — Spoke Length F: 298; R:295/297 — BB Drop: 70 (50cm:75) — BB Spindle: 116 — BB Height: 275 (50cm: 270) — Rear Overlocknut: 126

RB-2

Frame	Seat Tube	A	B	C	D	F	a	b	V	W	Y	Z	S	CR
50cm	500	525	410	574	973	50	72.5	74	55	743	133	392	80	170
53cm	530	545	410	580	979	45	73	73.5	57	773	146	399	100	170
56cm	560	565	410	590	990	45	73.5	73	54	800	159	406	100	175
59cm	590	585	410	595	995	40	74	72.5	56	828	172	413	120	175
62cm	620	600	410	604	1004	40	74.5	72.5	53	856	181	419	120	175

Q-Factor: 153 Seat Post: 27.0 — Spoke Length F: 298; R:295/297 — BB Drop: 70 (50cm:75) — BB Spindle: 116 — BB Height: 275 (50cm: 270) — Rear Overlocknut: 126

RB-T

Frame	Seat Tube	A	B	C	D	F	a	b	V	W	Y	Z	S	CR
50cm	500	525	430	584	1000	55	72	73.5	54	749	137	388	80	170
53cm	530	545	430	584	1004	50	72.5	73	56	777	150	395	100	170
56cm	560	565	430	595	1015	50	73	72.5	53	804	163	397	100	175
59cm	590	585	430	600	1020	45	73.5	72	55	831	177	408	120	175
62cm	620	600	430	614	1034	45	73.5	72	55	860	186	414	120	175

Q-Factor: 154 Seat Post: 27.0 — Spoke Length F: 303; R:301/303 — BB Drop: 70 — BB Spindle: 120 — BB Height: 275 — Rear Overlocknut: 126

XO-1

Frame	Seat Tube	A	B	C	D	F	a	b	V	W	Y	Z	S	CR
42cm	420	505	425	573	993	45	72	75	55	684	105	400	80	170
48cm	480	525	425	577	997	45	72	74	55	732	128	397	80	170
52cm	520	550	425	585	1005	40	73	73.5	55	769	143	407	90	170
55cm	550	565	425	595	1016	40	73	73	55	797	156	409	100	175
59cm	590	590	425	610	1031	40	73	73	55	831	168	422	100	175

Q-Factor: 151 Seat Post: 27.0 — Spoke Length F: 267; R:264/266 — BB Drop: 45 — BB Spindle: 116 — BB Height: 273 — Rear Overlocknut: 126

XO-2

Frame	Seat Tube	A	B	C	D	F	a	b	V	W	Y	Z	S	CR
42cm	420	505	425	583	1004	45	72	75	57	683	99	406	80	170
48cm	480	525	425	586	1008	45	72	74	57	729	123	402	80	170
52cm	520	550	425	588	1009	40	73	73.5	56	759	139	411	80	170
55cm	550	565	425	596	1017	40	73	73	56	786	151	414	100	175
59cm	590	580	425	611	1032	40	73	73	56	824	163	417	100	175

Q-Factor: 164 Seat Post: 26.2 — Spoke Length F: 266; R:262/264 — BB Drop: 45 — BB Spindle: 119 — BB Height: 275 — Rear Overlocknut: 130

XO-3

Frame	Seat Tube	A	B	C	D	F	a	b	V	W	Y	Z	S	CR
43cm	430	530	435	604	1032	50	72	74	61	705	107	423	110	170
46cm L	460	550	435	603	1031	50	72	74	61	584	0	0	110	170
48cm	480	535	435	605	1032	50	72	74	61	746	122	413	110	170
50cm	500	545	435	606	1033	50	72	73.5	61	738	127	418	110	170
53cm	530	575	435	609	1036	45	73	73	60	815	157	418	130	175

Q-Factor: 166 Seat Post: 26.2 — Spoke Length F: 296; R:293/295 — BB Drop: 65 — BB Spindle: 119 — BB Height: 284 — Rear Overlocknut: 130

CB-1

Frame	Seat Tube	A	B	C	D	F	a	b	V	W	Y	Z	S	CR
42cm	420	520	435	596	1027	50	71	73	62	694	113	407	80	170
43cm L	430	504	435	584	1038	50	71	73	62	580	114	390	80	170
46cm	460	540	435	613	1044	50	71	73	62	727	126	414	80	170
49cm L	490	534	435	607	1014	50	71	73	62	580	134	400	110	170
50cm	500	560	435	623	1054	50	71.5	72.5	59	763	141	419	110	170
56cm	560	570	435	620	1051	50	71.5	72.5	59	807	160	410	110	175

Q-Factor: 166 Seat Post: 26.2 — Spoke Length F: 264; R:260/262 — BB Drop: 50 — BB Spindle: 119 — BB Height: 279 — Rear Overlocknut: 130

Subject to change without notice

Specifications

	MB-1	MB-2	MB-3
Frame	100% Ritchey Logic Prestige CrMo	Ritchey Logic Prestige; CrMo rear half	Ritchey Logic CrMo
Fork	Ritchey Logic	Ritchey Logic	Ritchey Logic
Headset	Shimano Deore DX	Shimano Deore DX	Ritchey Logic
F. Derailleur	SunTour XC Pro	Shimano Deore XT	Shimano Deore DX
R. Derailleur	SunTour XC Pro	Shimano Deore XT	Shimano Deore DX
Shifters	SunTour XC Pro, top-mount	Shimano Deore XT, top-mount	Shimano Deore DX, top-mount
Cranks	Ritchey Logic; 46 x 36 x 24	Specialized ST-4; 46 x 36 x 24	Shimano Deore DX; 46 x 36 x 24
Bottom Bracket	Sugino; 120mm spindle	Specialized; 126mm spindle	Tioga, sealed; 122.5mm spindle
Pedals	Sakae Low-fat Comp	Sakae Low-fat, alloy track cage	Sakae Low-fat, alloy track cage
Freewheel	SunTour AP 7-speed 13-15-17-19-21-24-28	(cassette) Shimano Deore DX 7-speed 13-15-17-19-21-24-28	(cassette) Shimano Deore DX 7-speed 13-15-17-20-23-26-30
Chain	D.I.D. Lanner	Shimano Hyperglide	Shimano Hyperglide
Hubs	SunTour MicroLite	Shimano Deore DX 32H	Shimano Deore DX
Rim	Ritchey Vantage Comp 32H, silver	Ritchey Vantage Comp 32H, silver	Ritchey Vantage Expert 32H, silver
Tire	Ritchey Z-Max WCS, kevlar, 2.1"	Ritchey Z-Max, 2.1"	Ritchey Harddrive, 2.1"
Tube	Very light, presta valve	Very light, presta valve	Very light, presta valve
Spoke	Wheelsmith, butted 15 ga.	Wheelsmith, 15 ga.	Wheelsmith, 14 ga.
Brakes	Dia-Compe #987 canti; SS-5 lever	Dia-Compe #987 canti; SS-5 lever	Dia-Compe #986 canti; SS-5 lever
Saddle	Avocet racing, leather	Avocet racing, leather	Avocet racing, leather
Seat Post	Ritchey Logic; 300mm x 27.2mm	Sakae MTE-300; 300mm	Kalloy #243; 300mm
Handlebars	Ritchey Force; 6° x 54cm	Ritchey Force; 6° x 54cm	Ritchey Force; 6° x 54cm
Stem	Ritchey Force Comp; butted	Ritchey Force	Ritchey Force
Grips	Ritchey	Ritchey	Ritchey
Weight	24.7 lbs. (49cm)	26.2 lbs. (49cm)	26.7 lbs. (49cm)

	RB-1	RB-2	RB-T
Frame	Ishiwata CrMo; 019E, 022E, 024E	Ishiwata CrMo; triple-butted	Ishiwata CrMo; triple-butted
Fork	Ishiwata 019E; CrMo cast crown	Ishiwata CrMo; pressed crown	Ishiwata CrMo; pressed crown
Headset	Shimano Ultegra	Hatta Vesta, sealed	Hatta Vesta, sealed; Ritchey hanger
F. Derailleur	Shimano Ultegra	Shimano 400EX	Shimano RX100
R. Derailleur	Shimano Ultegra	Shimano 400EX	Shimano RX100
Shifters	Shimano Ultegra bar-end; (DT bosses)	Shimano 400EX	Shimano Ultegra bar-end; (DT bosses)
Cranks	Shimano Ultegra; 53 x 40	Sugino DAC; 53 x 40	Sugino TGP; 50 x 40 x 28
Bottom Bracket	Shimano Ultegra	Bolt type	Bolt type
Pedals	MKS Sylvan track; alloy	MKS Sylvan track; alloy	Sakae Low-fat; alloy track cage
Freewheel	(cassette) Ultegra 7-speed 13-14-15-17-19-21-23	(cassette) Shimano 7-speed 13-14-15-17-19-21-23	(cassette) Shimano 7-speed 13-15-17-19-21-24-28
Chain	Shimano Hyperglide	Shimano Hyperglide	Shimano Hyperglide
Hubs	Shimano Ultegra	Shimano Exage 500EX	Shimano 500EX
Rim	Ritchey Vantage Comp 32H, grey	Araya 20A 32H, silver	Araya VX-400 36H, silver
Tire	Ritchey Road Force-K 700 x 28C	Ritchey Road Force 700x28C	Avocet Duro 700 x 32C
Tube	Normal weight, presta valve	Normal weight, presta valve	Normal weight, presta valve
Spoke	Wheelsmith, butted 14 ga.	Stainless, 14 ga.	Wheelsmith, 14 ga.
Brakes	Dia-Compe BRS 300 sidepull & lever	Dia-Compe Blaze sidepulls & lever	Dia-Compe XCM canti; Blaze lever
Saddle	Avocet racing, leather	Avocet racing, vinyl	Avocet touring, vinyl
Seat Post	Sakae CLE 100; 220mm	Sakae CLE 100; 220mm	Sakae CLE 100; 220 mm
Handlebars	Nitto, modified #165, deep drop	Sakae, aluminum, NOT Modolo-style!	Sakae CTB aluminum; round bend
Stem	Ritchey Force Road	Sakae aluminum, melt-forged	Sakae #301
Grips	White plastic padded tape	White padded plastic tape	White padded plastic tape
Weight	22.5 lbs. (56cm)	23.6 lbs. (56cm)	25.4 lbs. (56cm)

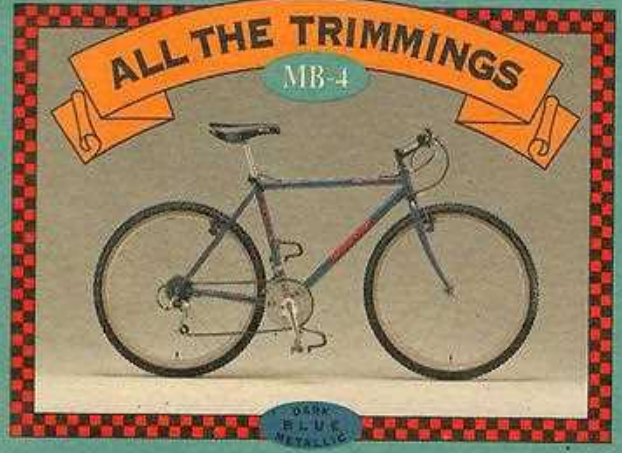
Subject to change without notice

Specifications

MB-4	MB-5	MB-6	CB-1
100% Tange CrMo; double-butted	100% Tange CrMo; double-butted	100% Tange CrMo; double-butted	CrMo main tubes; high-tensile stays
CrMo, 1 1/8" oval blades	CrMo, 1 1/8" oval blades	CrMo, 1 1/8" blades	CrMo, 1" blades
Ritchey Logic	Steel	Steel	Chrome-plated steel
Shimano Deore LX	Shimano 400LX	SunTour XCM Lite	Shimano 300LX
Shimano Deore LX	Shimano 400LX	SunTour XCM Lite	Shimano 300LX
Shimano Deore DX, top-mount	Shimano Deore DX, top-mount	SunTour XCM Lite, top-mount	Shimano 300LX, top-mount
Sugino TGP; 46 x 36 x 24	Shimano Deore LX; 46 x 36 x 24	Sugino XE-D; 48 x 38 x 28	Shimano 300LX; 48 x 38 x 28
Sealed; 122.5mm spindle	Bolt type	Bolt type	Nutted type
Sakae Low-fat; alloy track cage	Sakae MTP-170; steel and plastic	Victor 870; plastic with CrMo axle	Victor 870; plastic with CrMo axle
(cassette) Shimano 7-speed 13-15-17-20-23-26-30	(cassette) Shimano 7-speed 13-15-17-20-23-26-30	SunTour AP 7-speed 13-15-17-20-23-26-30	(cassette) Shimano 7-speed 13-15-17-19-21-24-28
Shimano Hyperglide	Shimano Hyperglide	D.I.D. Lanner	Shimano Hyperglide
Shimano Deore LX	Shimano 500LX	SunTour XCM	Shimano 300LX
Ritchey Vantage Sport 32H, silver	Ritchey Vantage Sport 32H, silver	Araya VP-20 36H, silver	Araya VP-20 36H, silver
Ritchey Harddrive, 2.1"	Ritchey Harddrive, 2.1"	Ritchey Force, 2.0"	Cheng Shin 26" x 1.9", knobby
Normal weight, presta valve	Normal weight, presta valve	Normal weight, presta valve	Normal weight, schraeder valve
Wheelsmith, 14 ga.	Stainless, 14 ga.	Stainless, 14 ga.	Stain-resistant, 14 ga.
Dia-Compe X-1 cantl; SS-5 lever	Dia-Compe XCE cantl & lever	Dia-Compe XCM cantl & lever	Shimano 300LX cantl & lever
Avocet racing, vinyl	Avocet touring, vinyl	Avocet touring, vinyl	Avocet touring, vinyl
Kalloy #243; 300mm	Kalloy #242; 300mm	Kalloy #242; 300mm	Kalloy #200; 220mm
Ritchey/Force/Taiwan); 6° x 54cm	HsinLung; aluminum, 6° x 54cm	Hsin Lung; steel, with rise	Hsin Lung; steel, low rise, black
Ritchey Force (Taiwan)	Hsin Lung #128-1; CrMo	Hsin Lung #115G-1; steel	Hsin Lung #115G-1; steel
Ritchey	Ritchey	Ritchey	Bridgestone "Maguro"
27.6 lbs. (49 cm)	28.7 lbs. (49 cm)	29.3 lbs. (49cm)	29.8 lbs. (50cm)

XO-1	XO-2	XO-3	RB-1
Shimano CrMo; 019E, 022E, 024E	Tange CrMo; butted	Tange CrMo; high-tensile stays	Tange CrMo; high-tensile stays
CrMo; Bridgestone Atlantis cast crown	CrMo; 1" blades, unicrown	CrMo; 1" blades, unicrown	CrMo; 1" blades, unicrown
Shimano Ultegra	Chrome-plated steel	Chrome-plated steel	Chrome-plated steel
Shimano 105	Shimano 400LX	Shimano 300LX	Shimano 300LX
Shimano 105	Shimano 400LX	Shimano 300LX	Shimano 300LX
Shimano Ultegra bar-end (DT bosses)	Shimano Deore DX, top-mount	Shimano 200GS, top-mount	Shimano 200GS, top mount
Sugino GP; 50 x 36	Shimano 500CX; 50 x 40 x 30	Shimano 300CX; 50 x 40 x 30	Shimano 300CX; 50 x 40 x 30
Sealed; bolt type	Bolt type	Bolt type	Nutted type
MKS Sylvan track; aluminum	Sakae #170; steel and plastic	Victor #870; plastic with CrMo spindle	Victor #870; plastic with CrMo spindle
(cassette) Shimano Deore DX 7-speed 13-15-17-19-21-24-28	(cassette) Shimano 7-speed 13-15-17-19-21-24-28	(cassette) Shimano 7-speed 13-15-17-19-21-24-28	(cassette) Shimano 7-speed 13-15-17-20-23-26-30
Shimano Hyperglide	Shimano Hyperglide	Shimano Hyperglide	Shimano Hyperglide
Shimano RX100	Shimano 500LX	Shimano 300LX	Shimano 300LX, both Q/R
Araya RM-17 32H, silver	Ritchey Vantage Sport 32H, silver	Araya PX-45 36H, silver	Araya MP-22 36H silver, alloy
Tioga City Slicker, 26" x 1.25"	Ritchey Tom's Slick 26" x 1.4"	Ritchey Tom's Slick 700 x 38C	Cheng Shin 26"x1.9", knobby
Normal weight, presta valve	Normal weight, presta valve	Normal weight, presta valve	Standard, with schraeder valve
Wheelsmith, 15 ga.	Stainless, 14 ga.	Stainless, 14 ga.	Stainless, 14 ga.
Dia-Compe BRS 300 sidepulls & lever	Dia-Compe XCE cantl & lever	Shimano 200CX, cantl; 200GS lever	Shimano 200CX cantl; 200GS lever
Avocet racing, leather	Avocet touring, vinyl	Avocet touring, vinyl	wide, cushy, vinyl
Sakae OLE 100; 220mm	Kalloy #242; 230mm	Kalloy #242; 230mm	Kalloy #200; 230mm
Nitto-built Moustache Handlebar	Hsin Lung-built Moustache Handlebar	Hsin Lung Arc Bar; steel	Hsin Lung #110; steel, flat
Ritchey 90° road stem	Hsin Lung 18000-1;115°, CrMo	Hsin Lung 115G-1; steel	Hsin Lung 115G-1; steel
White padded tape	Ritchey w/padded tape	Ritchey w/padded tape	Ritchey
24 lbs. (49cm)	27.1 lbs. (52cm)	28.7 lbs. (52cm)	29.8 lbs. (50cm)

Subject to change without notice


ALL THE TRIMMINGS
MB-4
DARK BLUE METALLIC

RED
PRINCE OF MB-5 THE TRAILS

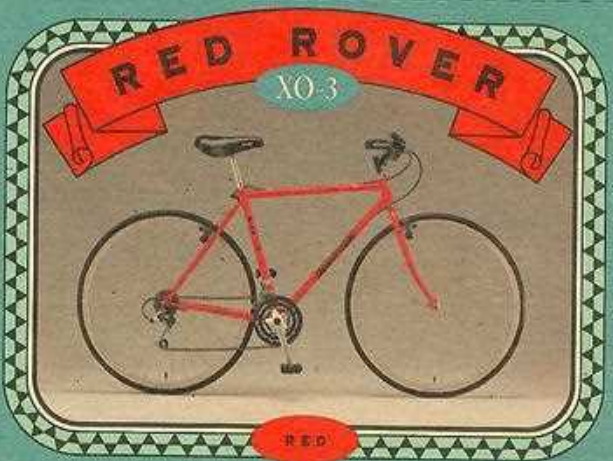
RB-1
INVINCIBLE
RED

DARK GREEN METALLIC
XO-2
VISCOUNT'S VELO

BLACK
MB-6
STALWART STEED

BB-1
SPIRIT O' SAN LEANDRO
DARK BLUE METALLIC

BLUE
SURE MB-3 BET!


RED ROVER
XO-3
RED

The MB-5 is the only bike in its price range—$480 to $520—with top-mount shifters, round aluminum chainrings, and smart parts. With the same geometry and handling as our most expensive models, you cannot beat this bike at this price.

FRAME: Tange butted CrMo
WHEELS: 26" Ritchey V-Sport rims, Megabite tires
COMPONENTS: Shimano 500LX & 400LX, with Dia-Compe brakes

FIRST YEAR MADE: 1987
FRAME BUILT IN: TAIWAN
PRODUCTION QUANTITY: 5,000
SIZES: 38, 42, 46, 49, 52, 55, 58CM

PRINCE OF MB-5 THE TRAILS

ALL THE TRIMMINGS

MB-4

FIRST YEAR MADE: 1987
FRAME BUILT IN: TAIWAN
PRODUCTION QUANTITY: 4,500
SIZES: 38, 42, 46, 49, 52, 55CM

FRAME: Tange butted CrMo
WHEELS: 26" Ritchey V-Expert rims, Megabite tires, Wheelsmith spokes
COMPONENTS: Shimano Deore LX with Dia-Compe brakes

At 27.6 lbs. (49CM) the MB-4 is just the bike for a rider who wants foolproof shifting and raceworthiness—but cannot afford an MB-3. Our product manager's favorite mountain bike.

XO-2

The XO-2's handlebar, brake and shifter set-up are unique and smart. With 26" x 1.4" Ritchey road tires, Shimano drivetrain, and Dia-Compe brakes, this is our most versatile bike.

FIRST YEAR MADE: 1992
FRAME BUILT IN: TAIWAN
PRODUCTION QUANTITY: 3,500
SIZES: 42, 48, 52, 55, 59CM

VISCOUNT'S VELO

RB-1

INVINCIBLE

FRAME: Ishiwata seamless CrMo
WHEELS: 700 x 28C, Ritchey rims and tires, Wheelsmith spokes
COMPONENTS: Shimano Ultegra with Dia-Compe brakes, Ritchey stem

The RB-1 is everything we think a road bike should be. The laid-back seat tube angle, deep-drop handlebars, and classic good looks make this the right choice for anyone interested in a fine road bike.

FIRST YEAR MADE: 1988
FRAME BUILT IN: JAPAN
PRODUCTION QUANTITY: 1,200-1,500
SIZES: 50, 53, 54.5, 56, 57.5, 59, 62CM

BB-1

SPIRIT O' SAN LEANDRO

FIRST YEAR MADE: 1992
FRAME BUILT IN: TAIWAN
PRODUCTION QUANTITY: 7,500
SIZES: 42, 43L, 46, 49L, 50, 56CM

For casual rides, the BB-1 is perfect. Though it looks a lot like a mountain bike, the BB-1's frame is designed specifically for riding on pavement and fire roads. Note the top-mount shifters and round chainrings; both are rare on bikes in this price range. Shimano 300CX components, round rings, top-mount shifters.

MB-6

For a first good mountain bike that you won't outgrow as you polish your skills and your enthusiasm grows, you can't beat an MB-6. SunTour drivetrain, Dia-Compe brakes.
PRODUCTION QUANTITY: 10-12,000; SIZES: 38, 42, 46, 49, 52, 55CM

FRAME:
Tange butted CrMo
WHEELS:
26" Ritchey V-Sport rims, Megabite tires
COMPONENTS:
Shimano 500LX & 400LX with Dia-Compe brakes

STALWART STEED

RED ROVER

XO-3

FIRST YEAR MADE: 1992
FRAME BUILT IN: TAIWAN
PRODUCTION QUANTITY: 3,000
SIZES: 43, 46L, 48, 52, 57CM

The XO-3 solves many problems of the conventional "hybrid": Its "ARC" bars position your wrists more inward, for better climbing and sprinting, the top-mount shifters are easier to use than underbar shifters, and the round chainrings promote smooth pedaling. Shimano 300CX derailleurs and crank; Ritchey tires; and stainless spokes.

Last year in a review of 12 "mid-priced" mountain bikes, *Bicycle Guide* rated the MB-3 the best. This was no surprise. The MB-3 is always excellent, and the '92 model is the best yet.

FRAME: Ritchey Logic
WHEELS: 26" Ritchey V-Expert rims, Megabite tires, Wheelsmith spokes
COMPONENTS: Shimano Deore DX with Dia-Compe brakes

FIRST YEAR MADE: 1987
FRAME BUILT IN: TAIWAN
PRODUCTION QUANTITY: 4,500
SIZES: 38, 42, 46, 49, 52, 55CM

SURE MB-3 BET!